

Exploring learning and fit in the transition from higher education to the labour market:

A systematic review

Ilke Grosemans^a, Liesje Coertjens^{b,c}, & Eva Kyndt^a

^a Centre for Research on Professional Learning & Development, and Lifelong Learning, KU Leuven – University of Leuven, Dekenstraat 2 – PB 3772, B-3000 Leuven, Belgium

^b Psychological Sciences Research Institute, Catholic University of Louvain, Place de l'Université, B-1348, Louvain-La-Neuve, Belgium

^c Instructional and Educational Sciences, University of Antwerp, Gratiekapelstraat 10, B-2000, Antwerpen, Belgium

Correspondence:

Ilke Grosemans, Centre for Research on Professional Learning & Development, and Lifelong Learning, KU Leuven, Dekenstraat 2 – PB 3772, 3000 Leuven (Belgium). Tel: 0032 16 37 77 75, Ilke.Grosemans@kuleuven.be

Abstract

The transition from higher education to the labour market is an important period for youngsters, characterised by extensive changes which act as triggers for learning. Furthermore, students' educational background and the (in)congruence with their work context is important. Accordingly, the aim of this systematic review is to explore the role of learning and fit in the transition process. Results indicate that most emphasis is put on theoretical knowledge, communication, problem-solving, and learning skills. Although the perception on what has to be learned differs for employers, educators, and graduates, each group valued generic competences most. Results show that transfer can be experienced in three ways and the need for learning at work is stressed. Concerning fit, four types of fit are distinguished: vertical, horizontal, competence, and person-environment fit. Several personal background characteristics are shown to influence fit and findings indicate that fit has an influence on career progress and personal resources.

Keywords: transition; higher education; learning outcomes; fit.

The period of entering the labour market after finishing education is important for every graduate (Koen, Klehe, & Van Vianen, 2012). In this transition from education to the labour market the certainty and stability of education is left behind and is exchanged for an uncertain and more dynamic period (e.g., Kowtha, 2011). The transition can be considered as uncertain, due to the quickly changing labour market. These quick changes on the labour market, influenced by globalisation and rapid technological changes, lead to a continual increase of the demands placed upon graduates (Hurtz & Williams, 2009). To cope with the demands of the changing labour market (Kuijpers & Meijers, 2012), graduates will need constantly to update their knowledge, skills, and attitudes (e.g., Tynjälä, 2008). As such, a need to focus on learning in the transition from higher education to the labour market arises.

Next to uncertainty, the transition should also be viewed as dynamic (Kowtha, 2010): A graduate can take countless career paths after education (e.g., graduates with a diploma in one discipline can enter jobs in different disciplines). This has implications for graduates' fit between their job and their educational background (Leuven & Oosterbeek, 2011), which can be operationalised as the combination of their study discipline (i.e., the content of study) and their educational level (i.e., standard of education). Besides the factual fit in terms of content and educational level, graduates' experiences of this fit are important. Regardless of the factual fit, graduates often find that their education and their job are not perfectly aligned (e.g., Abrandt Dahlgren, Hult, Dahlgren, Hård af Segerstad, & Johansson, 2006). When studying the transition from education to the labour market, both the factual fit and the perceived fit are important to take into account.

Although the transition from education to the labour market is an important period for every graduate, it can be expected that the demands placed on graduates will vary according to educational levels (i.e., what has to be learned before entering the labour market will differ for graduates at different educational levels). A growing group of graduates entering the labour market have a higher education degree. In 2012, 40% of the adults between 25 and 34 years old in OECD countries had attained higher education (OECD, 2014). With this, the need arises to have a more profound understanding of the transition from higher education to the labour market.

The aim of this systematic literature review is to focus on this transition and, on the one hand, to explore what has to be learned in and for this transition and, on the other hand, to examine how fit between the (educational) background and the job is experienced. The following section starts with a discussion of what is meant by the transition from education to the labour market. Secondly, it stresses why learning and fit between the (educational) background and the job are of importance in the transition and what their role is in the transition process. Subsequently, the method is presented, followed by the results. Finally, the main conclusions are outlined and suggestions for future research are discussed.

1. Theoretical background

1.1 Transition from Education to the Labour Market

The transition from education to the labour market can be seen as a process that starts in education and continues after graduation until the graduate is settled in a job (e.g., Nicholson, 1990). Although some studies approach the transition as the short period after graduation and before employment (e.g., Vanoverberghe, Verhaest, Verhofstadt, & Omeij, 2008), in this review the transition will be considered in the broader sense, entailing leaving one context (i.e., education) and entering another context (Abrandt Dahlgren et al., 2006; Baytiyeh & Naja, 2012). Therefore we are responding to Teichler (2007) who explicitly stressed the need for a process-based approach of the transition from education to the labour market, as such an approach could provide a more complete view on the transition.

To emphasise the process of transition, the model of Nicholson (1990) has been chosen as a theoretical framework. The model consists of four stages: preparation, encounter, adjustment, and stabilisation. In the *preparation stage*, becoming ready for the future is the main concern of the person in transition. People in transition must have a clear view of their expectations and motives (Nicholson, 1990). In the transition to the labour market, the preparation stage can be seen as the period in education and the period after graduation before finding employment. The *encounter stage* refers to the first days or weeks at work. This stage is mainly characterised by new experiences and new emotions (Nicholson, 1990). After the first days or weeks in this new context, the *adjustment stage* starts, by achieving a

relationship between the self and the environment as a core activity. The process of assimilating to the new context is central in this stage (Nicholson, 1990). Lastly, performing in the new context is important in the *stabilisation stage* and effectiveness is the goal of this stage (Nicholson, 1990).

This process model offers a general framework that can be applied to all research investigating a period of transition and most research focuses on (one of) these stages. However, the topics and perspectives of the different studies largely differ (Filstad & McManus, 2011), creating a research field that is mainly scattered. This underpins the need for a systematic review study to get an overview of the literature on a specific topic in the transition from education to the labour market.

1.2 Learning in the Transition Process

The transition from education to the labour market is a period of extensive change for graduates and this switching of contexts creates opportunities to use what is learned before and to learn new things. Therefore, learning activities and learning outcomes, relevant in and for the transition are studied in this review. Learning outcomes can be defined as a change in knowledge, skills, and attitudes as a consequence of the engagement in learning activities (Doyle, Reid, & Young, 2008; Kyndt & Baert, 2013). Furthermore, only work-related learning activities and outcomes will be considered, as the main focus of the review study is the transition to work.

When situating learning activities and learning outcomes within the four stages of the transition model of Nicholson (1990), learning can be considered relevant and necessary at every stage of the transition process. Preparing students for work and for lifelong learning is one of the main aims of education (e.g., Endedijk & Vermunt, 2013; Le Maistre & Paré, 2004; Teichler, 2007). A main concern of education is which knowledge, skills, and attitudes need to be developed in order to reach these aims (Yan, Gao, & Lam, 2013). According to Young and Chapman (2010), students currently need to develop a wide range of knowledge, skills, and attitudes. To classify these necessary learning outcomes for the transition from higher education to the labour market, the content-clustered framework of Young and Chapman (2010) will be used, as it integrates different frameworks on knowledge, skills, and attitudes. In their framework, five clusters of knowledge, skills, and attitudes are proposed, which are

described in their framework as competences: basic competences (1), business competences (2), conceptual competences (3), personal competences (4), and people competences (5). Literacy, numeracy, and technology are examples of basic competences, indicating that basic competences are those that provide the basis for everyone to perform the job adequately. More job-specific competences, that are not necessarily relevant for every job, can be clustered in the business competences, like financial planning and merchandising. Conceptual competences mainly refer to competences that require analysing and creativity, such as problem-solving and reasoning (Young & Chapman, 2010). Personal competences are related to personal effectiveness and lifelong learning (Strijbos, Engels, & Struyven, 2015; Young & Chapman, 2010). People competences refer to competences related to others. Examples of people competences are teamwork and communication (Young & Chapman, 2010).

While Young and Chapman (2010) provide a content-wise clustering of the competences, they are also often clustered by the degree to which they can be transferred to another context. In the framework of Young and Chapman (2010) the business competences (2) are specific competences that are explicitly related to a study discipline (Biesma, Pavlova, van Merode, & Groot, 2007). Generic competences, on the other hand, are competences that are not related to a specific context and are therefore potentially more easily transferred to another context (Nicolescu & Păun, 2009; Teichler, 2007). All other competences (i.e., basic, conceptual, personal, and people competences) in the framework of Young and Chapman (2010) are generic in nature, indicating that they are necessary for every graduate in every job (e.g., Heijke, Meng, & Ris, 2003).

Relating learning to the different transition stages, the role of learning in the preparation stage mainly refers to the learning outcomes of higher education relevant to the (future) job of graduates. On the other hand, the role of learning, when entering the job, in the encounter and adjustment stage, can be interpreted as the process of transfer between the educational and work context (e.g., Nilsson, 2010), which can be defined as the transformation of knowledge, skills, and attitudes and the adaptation to the new context in which recent graduates take an active role (Bransford & Schwarz, 1999). Research has shown that it is necessary to gain a better understanding of the transfer process and how the learning outcomes of education are put into practice (Filstad & McManus, 2011; Finnie, 2004). In most cases,

the knowledge, skills, and attitudes that are developed in education will not completely match the requirements of the job. Consequently, the graduate will have to engage in learning activities at work. Summarised, work-related learning activities and outcomes emerge as an important topic in the entire transition process.

1.3 Fit in the Transition Process

When entering the labour market, fit can be experienced in different ways. A disconnection between the supply side and the demand side can often be found (Graham, Shier, & Eisenstat, 2014; Nilsson, 2010) and, as mentioned by Heijke et al. (2003), the matching process of graduates has gained much attention in the literature. There used to be a strong belief in a single relationship between education and jobs, narrowing the issue of factual fit to having access to information on the connection between education and jobs (Kuijpers & Meijers, 2012). Nowadays, the career trajectory of graduates becomes more complex and so does the relationship between education and jobs: Graduates with the same educational background can apply for a range of jobs and one job can be executed by graduates with different educational backgrounds. As such, next to the factual fit, the fit as perceived by the graduates is important as well (Kowtha, 2011). We are therefore convinced that, when studying the transition from higher education to the labour market, more insight is needed into the (experienced) fit between the educational background and the job.

When focusing on the role of fit between the educational background and the job, different types of fit can be distinguished. The first type of fit refers to the *vertical fit* between education and job. This fit can be described as the extent to which the level of education (e.g., bachelor, master) corresponds to the level of education required for the job (Heijke et al., 2003). When the level of education of the graduate is higher than the required level (e.g., a graduate with a master's diploma working in a job that requires a bachelor's diploma), the graduate is considered to be overeducated for the job (Baert, Cockx, & Verhaest, 2013), while the opposite is called undereducation (Verhaest & Omeij, 2003). The second type of fit is the *horizontal fit*, which indicates the degree of fit between the study discipline and the job (Heijke et al., 2003). For example, a graduate with a teacher's degree working as a teacher in a school

has a high horizontal fit, while a graduate with a teacher's degree working as an assistant in a bank has a low horizontal fit. Thirdly, a type of fit that comes to the fore during the transition from higher education to the labour market is the *competence fit*. This type of fit reflects the match between the learning outcomes of education and the knowledge, skills, and attitudes necessary to perform the job or, in other words, the gap between what education delivers and what employers want (Nicolescu & Păun, 2009). This competence fit can arise because a different set of knowledge, skills, and attitudes is required (e.g., due to a vertical or horizontal misfit) or because knowledge, skills, or attitudes need to be further developed at work. Finally, the *fit between the person and the environment* can be taken into account. This fit can be defined as the relationship between the interests, values, and abilities of the graduate with those of the environment or organisation (Sung, Turner, & Kaewchinda, 2011).

The experience of these different types of fit will mainly occur in the encounter and adjustment stage of the model of Nicholson (1990), as the graduate, at that moment, encounters the first experiences with the workplace. Furthermore, experienced fit will contribute to the stabilisation stage, because the fit will have different consequences that will be experienced after the first period at work. Moreover, the influence of the background of the person in transition is often studied as a precedent of the matching process, as the personal background of the graduate (e.g., study discipline, gender, parental background) can have an effect on the experienced fit in the transition from education to the labour market (e.g., Opheim, 2007).

1.4 Present Study

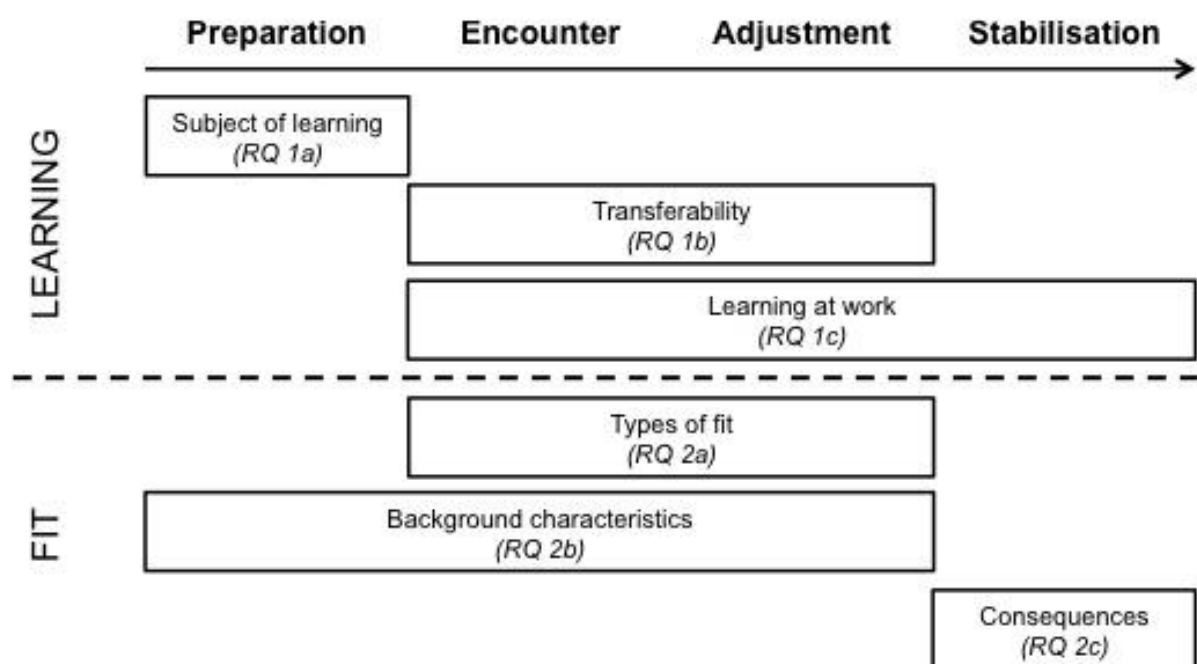
It is widely accepted that the transition from higher education to the labour market is a critical period for young adults and that the necessary learning outcomes and the perceived fit between the (educational) background and the job take a prominent role. Yet no systematic overview of the role of learning or the role of fit in the transition can be found in literature. Given that research on the transition is largely scattered, we aim to examine and integrate findings concerning the role of learning and the role of fit in the transition. Therefore, we chose to conduct a systematic literature review, as it gives the opportunity to explore the literature in a transparent and reproducible way (Gough, Oliver, & Thomas,

2012). The first research question relates to the role of learning in the transition from higher education to the labour market. More specifically, we are interested in the preparation of students before entering the labour market (RQ 1a), in how the learning outcomes are transferred to the job in the first period at work (encounter and adjustment stage; RQ 1b), and in how graduates learn at work in the encounter, adjustment, and stabilisation stage (RQ 1c). An overview of the research topics in relation to the transition stages can be found in Figure 1.

RQ 1a. What has to be learned in higher education to be prepared for the labour market?

RQ 1b. How is the transfer of the learning outcomes experienced in the transition?

RQ 1c. What is the role of learning at work in the transition process?



The second strand of research questions relates to the experienced fit in the transition from higher education to the labour market. We are interested in the types of fit in the encounter and adjustment stage as described in literature (2a), the influences of the background of the person on fit before entering the workplace, that can play a role as an antecedent (before starting work) or can be established at work (2b) and the consequences of fit that emerge when stabilised in the workplace (2c).

RQ 2a. Which types of fit can be found in the transition from higher education to the labour market?

RQ 2b. What are the influences of personal background on (mis)fit?

RQ 2c. What are the consequences for the graduate of (mis)fit?

2. Method

Different steps were taken in order to make a systematic search and select the relevant literature. First, an extensive literature search was performed within four different databases. Subsequently, irrelevant literature was eliminated on the basis of exclusion criteria. Thirdly, the quality of the selected literature was appraised. In order to answer the proposed research questions, the final step entailed the analysis of the selected literature.

2.1 Literature Search

As the goal of this study was to get a complete overview of the transition from higher education to the labour market, the literature was systematically searched for studies focusing on this transition. In line with previous systematic review studies on related topics (e.g., Kyndt & Baert, 2013) the following databases were used: ERIC (OvidSP), Social Science Citation Index, Econlit, and FRANCIS. In our literature search, the term ‘transition’ was coupled with all combinations of ‘education’, ‘school’, ‘college’, or ‘university’ and ‘labo(u)r market’, ‘work’, or ‘employment’. Moreover, these terms were also combined with the infix ‘to’ instead of ‘transition’, for example ‘college to work’. The search terms were also translated to Dutch and used in the four databases. These search terms in English and Dutch led to 47,247 hits. After removing doubles, 20,454 unique references remained. An overview of the results of this search per database can be found in Table 1.

Table 1

Overview of Literature Search

Search terms	ERIC (OvidSP)	SSCI	EconLit	FRANCIS
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Transition & Education & Work	3977	1503	832	744
Transition & Education & Labo(u)r market	822	480	1858	71
Transition & Education & Employment	3572	855	758	542
Transition & College & Work	1975	337	222	193
Transition & College & Labo(u)r market	199	73	323	15
Transition & College & Employment	775	131	205	81
Transition & University & Work	1869	505	868	1109
Transition & University & Labo(u)r market	174	112	1264	132
Transition & University & Employment	688	153	802	442
Transition & School & Work	3961	1521	583	950
Transition & School & Labo(u)r market	511	322	658	61
Transition & School & Employment	2181	656	447	471
“Education to work”	128	58	26	306
“Education to labo(u)r market”	4	1	1	10
“Education to employment”	56	23	13	432
“College to work”	31	11	6	18
“College to labo(u)r market”	0	0	0	0
“College to employment”	3	1	0	10
“University to work”	14	13	6	35

“University to labo(u)r market”	0	0	0	0
“University to employment”	3	5	0	3
“School to work”	2345	532	259	1750
“School to labo(u)r market”	1	0	0	2
“School to employment”	89	11	2	29
Total	23378	7303	9106	7406
Overall Total	47247			

2.2 Selection

To reduce this number of references, several exclusion criteria were used. An evident criterion was the exclusion of all articles not focusing on the transition from education to the labour market (a). We decided to include all studies that focused on the transition, even if they merely focused on one stage of the process. Furthermore, the goal of the systematic review study was to get more insight into the overall transition process of higher education students/graduates from a general population. Therefore, the following references were excluded: studies with a specific focus on drop-out or early school leavers (b); studies with a focus on specific but non-geographical groups (e.g., students with disabilities, gifted students) (c); studies focusing solely on internships or career counselling (d); policy oriented initiatives, specific reform practices (e); instructional guides and/or studies that solely describe the situation in a specific country (f). Furthermore, all non-empirical studies (g); non peer-reviewed studies (h); and studies not in English or Dutch (i) were excluded.

The selection was conducted in several steps. In each step, all studies that clearly met one of the exclusion criteria were excluded. When in doubt about a study, the reference was retained until the next step. The first step comprised the selection based on the title of the manuscript. After this step, 4301 studies remained. Afterwards, a selection based on abstract was made, leaving 951 studies. As the abstracts of 18 studies could not be retrieved, these studies were also removed and thus 933 studies remained. In the next step, studies published before 1990 were not retained. As such, 722 studies

remained. Subsequently, the studies were categorised in accordance with the educational level they focused on. As the focus of this systematic literature review study is on the transition from higher education to the labour market, only the studies that included higher education were retained, leaving 376 studies. In the following step these abstracts were read in order to retain the studies focusing on learning and/or fit. Afterwards, full texts were skim-read to be certain that all studies focused on learning and/or fit. After this step, the final selection consisted of 45 primary studies.

2.3 Critical Appraisal

The quality of the primary studies ($N = 45$) was assessed in order to exclude studies of low quality. The guidelines from the Critical Appraisal Skills Programme (CASP, 2013) were applied to all qualitative ($n = 17$) and mixed-method studies ($n = 3$), and the checklists of the National Institute for Health and Clinical Excellence (2009) were applied for quantitative studies ($n = 25$). The tools for the critical appraisal of the research studies mainly focused on a well-described statement of the aims of the research, an appropriate design, a clear sampling procedure, a profound data selection and analysis, ethical considerations, and the description of the results. Based on these criteria, each primary study got a score (i.e., high, medium, or low). As can be found in Appendix A and Appendix B, the primary studies all had a medium or high quality and no studies were excluded due to low quality.

2.4 Analysis of Literature

The analysis followed the method described by the guidelines of Aveyard (2010). A first step in the analysis comprised the inventory of the characteristics of the studies (e.g., country, participants, method; see Appendix C). Secondly, each study was read carefully and an in-depth exploration was executed. This in-depth exploration entailed the categorisation of the relevant findings for the research questions using the content analysis method (Aveyard, 2010). To answer the research questions, every passage was labelled with a code which referred to the different research questions: Learning outcomes (RQ 1a); Transfer of learning outcomes (RQ 1b); Learning at work (RQ 1c); Types of fit (RQ 2a); Influences of personal background on fit (RQ 2b); Consequences of fit (RQ 2c). In the third and final

step, the results were analysed beyond the individual studies. Each theme (across the different studies) was analysed in order to get insight into the role of learning and fit in the transition from higher education to the labour market. In this analysis the results were examined and it was decided whether they were consistent or contradictory across the studies. The goal of analysing the literature was to synthesise all the information from the primary studies in order to detect patterns and integrate the different findings (Aveyard, 2010).

3. Results

Before focusing on the results regarding the role of learning and the role of fit in the transition from higher education to the labour market, descriptive information was provided about the selected studies concerning perspectives and the approach of the transition. In the selected literature, the perspectives of the different stakeholders in the transition came to the fore and the studies took the perspective of students before graduation ($n = 17$), graduates ($n = 32$), employers ($n = 5$), and staff in education ($n = 3$). It can be noted that some studies included more than one perspective (e.g., Evers & Rush, 1996). Furthermore, certain studies tried to grasp the transition as a process and included more than one measurement moment ($n = 16$). In the following, the role of learning and the role of fit are further explored.

3.1 Learning

The first research question considers the role learning takes in the transition from higher education to the labour market. Different perspectives on learning can be taken in the transition across the different stages of the process (i.e., before graduation, between education and the job, and at the job). Therefore, the results on the learning outcomes will be demonstrated first, indicating what has to be learned in order for graduates to be prepared for the labour market. Subsequently, the process of transferring these learning outcomes from the educational context to a work context is highlighted. Finally, not all necessary knowledge, skills, and attitudes will be (fully) developed before entering the labour market. Therefore, findings on learning at work are presented.

Learning outcomes (RQ 1a). Twenty-two studies focused on the distinct knowledge, skills, or attitudes that are expected to have been developed by higher education graduates in order to be prepared to enter the labour market. The knowledge, skills, and attitudes will be described in line with the used terms in the primary studies and will be categorised according to the framework of Young and Chapman (2010). An overview of all necessary knowledge, skills, and attitudes as identified in the current literature, can be found in Table 2.

Basic competences (1). Only five studies focused on basic competences. Results showed that the concrete learning outcomes in the studies are *language skills* (Johansson, Kopciwicz, & Dahlgren, 2008) and *computer knowledge and skills* or information technology (Lowe & Krahn, 1995; McMurray, Roberts, Robertson, & Teoh, 2011; Nicolescu & Păun, 2009). Although this basic knowledge was stressed as necessary to be developed before entering the labour market, the reason for the importance of this knowledge was not indicated (e.g., Nicolescu & Păun, 2009).

Business competences (2). In contrast to the basic competences, which can be considered as generic, the business competences relate to specialised competences (i.e., competences related to a specific job). In 10 studies, *theoretical knowledge* was considered as an important aspect of preparation (e.g., Lowe & Krahn, 1995; Nilsson, 2010), although the relative importance varied across disciplines. According to Nilsson (2010), physicians, for example, indicate that theoretical knowledge is necessary, as every aspect of their job builds on previous knowledge, while the theoretical knowledge of engineers is loosely coupled and was therefore perceived as less useful (Nilsson, 2010). Biesma et al. (2007) indicated that employers did not put a high value on the theoretical knowledge of public health workers. Furthermore, Nicolescu and Păun (2009) found that graduates thought that theoretical knowledge is the least useful in the workplace. Besides the theoretical knowledge, *technical skills* (e.g., financial skills, techniques in health care) were found to be important in order to feel prepared for the labour market (Lowe & Krahn, 1995; Martin, Maytham, Case, & Fraser, 2005). Six studies showed that *practical knowledge and skills* specified for the job are considered important in the transition (Lowe & Krahn, 1995; Nilsson, 2010; Pennbrant, Skyvell Nilsson, Öhlén, & Rudman, 2013; Teichler, 2007; Yan et al., 2013; Zuccheromaglio & Alby, 2009).

Conceptual competences (3). Analysis revealed that conceptual competences are considered useful when entering the labour market. More specifically, problem-solving skills are valued by graduates when entering the labour market (Abrandt Dahlgren et al., 2006; Evers & Rush, 1996; Landrum, Hettich, & Wilner, 2010; Nilsson, 2010) as well as by employers (Biesma et al., 2007; Evers & Rush, 1996). Aligned to this, prior to entering the labour market, students value their education because it provides them with *problem-solving skills* (e.g., Edvardsson Stiвне & Jungert, 2010; McMurray et al., 2011). Besides problem-solving skills, *analytical skills* were highlighted in the literature (Abrandt Dahlgren et al., 2006; Edgar et al., 2013; Lowe & Krahn, 1995; Nilsson, 2010), as well as *logical reasoning* (Nilsson, 2010), having an *achievement orientation* (Edgar et al., 2013), *finding optimal solutions* (Abrandt Dahlgren et al., 2006), and *decision-making* (e.g., Landrum et al., 2010). Furthermore, *creativity and having an innovative attitude* made a positive contribution to the transition to the labour market, however the value of creativity is mainly stressed by employers (Biesma et al., 2007; Evers & Rush, 1996).

Personal competences (4). Results showed that a wide range of personal competences are expected to be developed before entering the labour market. First of all, learning skills are believed to be important skills that need to be developed. This is stated by employers (Edgar et al., 2013; Evers & Rush, 1996), students (McMurray et al., 2011; Zuccheromaglio & Alby, 2009) as well as graduates (Evers & Rush, 1996; Johansson et al., 2008; Lindberg, 2010; Nilsson, 2010). Furthermore, Abrandt Dahlgren et al. (2006) indicated that the *ability to reflect* is necessary for graduates, and the results of the studies of Nicolescu and Păun (2009) and Nilsson (2010) emphasised orienting and learning in new areas and assimilating new knowledge. Besides skills related to learning, skills related to professional behaviour in the workplace such as *time management* and *setting priorities* were emphasised (Evers & Rush, 1996; Landrum et al., 2010; Zuccheromaglio & Alby, 2009). Furthermore, working independently was stressed, including *working without supervision* (Landrum et al., 2010; Nicolescu & Păun, 2009), *managing several tasks at once* (Landrum et al., 2010), *being structured* (Nilsson, 2010), and *managing stress and workload* (Edvardsson Stiвне & Jungert, 2010; Lindberg, 2010). Besides this, five studies showed that *critical thinking* is an important asset in the workplace for recent graduates (e.g., Abrandt

Dahlgren et al., 2006; Edgar et al., 2013; Nilsson, 2010). Evers and Rush (1996) indicated that *having a clear vision* and *being able to take risks* are important skills. Landrum et al. (2010) showed that *acting responsibly* is vital in the workplace. Lindberg (2010) added to this view by indicating that graduate physicians specified that *handling night duty* cannot be underestimated in their job, due to the responsibilities it brings.

Abrandt Dahlgren et al. (2006) and Nilsson (2010) indicated that *being flexible* is highly appreciated. In contrast, Biesma et al. (2007) stated that, relatively speaking, being flexible is less important for employers in the public health field. Furthermore, five studies found that *managing yourself* plays an important role when entering the labour market (Edvardsson Stiwné & Jungert, 2010; Evers & Rush, 1996; Landrum et al., 2010; Lindberg, 2010; Lowe & Krahn, 1995). Lastly, as a personal competence, it is important for students before graduating and for graduates to possess *competences central to career development* (i.e., career competences) in order to shape their (early) careers (Bridgstock, 2011; Kuijpers & Meijers, 2012; McMurray et al., 2011).

People competences (5). *Leadership* was shown to be crucial to be fully prepared for work, both in research investigating the perspective of employers (Edgar et al., 2013) and in research focusing on the perspective of graduates (Martin et al., 2005). In line with leadership, *management skills* are of the utmost importance (e.g., Lowe & Krahn, 1995) and more specifically managing people (Evers & Rush, 1996). Although leadership is increasingly important for higher education graduates, people competences comprise more than only leadership. *Interpersonal skills* were shown to be essential for all graduates (Edgar et al., 2013; Evers & Rush, 1996; Landrum et al., 2010; Lindberg, 2010; Lowe & Krahn, 1995; Martin et al., 2005). In this respect, results showed that *communication skills* were mentioned most often in the category of people competences and thus appear to be indispensable (Abrandt Dahlgren et al., 2006; Biesma et al., 2007; Edgar et al., 2013; Evers & Rush, 1996; Johansson et al., 2008; Lowe & Krahn, 1995; Martin et al., 2005; McMurray et al., 2011; Nicolescu & Păun, 2009). These communicating skills related to both colleagues and clients. In medically oriented disciplines, *maintaining relations* with clients and meeting their needs was also shown to be a required competence when entering the labour market (Landrum et al., 2010; Lindberg, 2010). *Working as a team* was

emphasised as a necessary skill in seven studies (Biesma et al., 2007; Edgar et al., 2013; Landrum et al., 2010; Lindberg, 2010; Lowe & Krahn, 1995; Martin et al., 2005; Nicolescu & Păun, 2009). In line with working in teams, the importance of *working in a multidisciplinary way* in teams was stressed, which values communication and teamwork with colleagues from different sectors (Martin et al., 2005). Furthermore, *listening skills* (Evers & Rush, 1996), and *negotiation* (Teichler, 2007) were shown to play a role for starting graduates in the workplace.

As mentioned, the framework of Young and Chapman (2010) mainly focuses on generic competences that can be applied in different jobs, with the exception of the business competences. The distinction between generic competences and job-specific competences was frequently used in the primary studies (i.e., 14 out of 21 studies). It can be noted that generic competences were more frequently studied than specific competences (e.g., Abrandt Dahlgren et al., 2006; Biesma et al., 2007; Lindberg, 2010; Lowe & Krahn, 1995; McMurray et al., 2011). Biesma et al. (2007) and Nicolescu and Păun (2009) also concluded that generic competences are more important to develop than specific competences before entering the labour market. The main reason for the relative importance of these generic competences above the importance of specific competences is that these generic competences are applicable in a variety of contexts (Heijke et al., 2003). Students, for example, indicated that generic skills will offer them a solid foundation for different trajectories in their future career (McMurray et al., 2011). On the other hand, the research of Lindberg (2010) pointed to the fact that specific and generic knowledge, skills, and attitudes are intertwined and both essential: Medical students, for example, indicated that to be able to communicate professionally with patients, a thorough theoretical knowledge is necessary.

Table 2

Overview of Important Knowledge, Skills, and Attitudes

Cluster	Competence	References
Basic competences	Computer skills/Information technology (n = 4)	Lowe & Krahn (1995) McMurray, Roberts, Robertson, & Teoh (2011) Nicolescu & Păun (2009) Teichler (2007)
	Language skills (n = 1)	Johansson, Kopciwicz, & Dahlgren (2008)
Business competences	Theoretical knowledge (n = 10)	Abrandt Dahlgren, Hult, Dahlgren, Hård af Segerstad, & Johansson (2006) Biesma, Pavlova, van Merode, & Groot (2007) Edvardsson Stiwne & Jungert (2010) Lowe & Krahn (1995) Lindberg (2010) Martin, Maytham, Case, & Fraser (2005) Nicolescu & Păun (2009) Nilsson (2010) Teichler (2007) Yan, Gao, & Lam (2013)
	Practical skills (n = 6)	Lowe & Krahn (1995) Nilsson (2010) Pennbrant, Skyvell Nilsson, Öhlén, & Rudman (2013) Teichler (2007) Yan, Gao, & Lam (2013) Zuccheromaglio & Alby (2009)
	Technical competences (n = 3)	Edgar et al. (2013) Lowe & Krahn (1995) Martin, Maytham, Case, & Fraser (2005)

Conceptual competences	Problem-solving (n = 10)	Abrandt Dahlgren, Hult, Dahlgren, Hård af Segerstad, & Johansson (2006) Abrandt Dahlgren, Reid, Dahlgren, & Petocz (2008) Biesma, Pavlova, van Merode, & Groot (2007) Edvardsson Stiвне & Jungert (2010) Evers & Rush (1996) Landrum, Hettich, & Wilner (2010) Martin, Maytham, Case, & Fraser (2010) McMurray, Roberts, Robertson, & Teoh (2011) Nicolescu & Păun (2009) Nilsson (2010)
	Analytical thinking (n = 6)	Abrandt Dahlgren, Hult, Dahlgren, Hård af Segerstad, & Johansson (2006) Abrandt Dahlgren, Reid, Dahlgren, & Petocz (2008) Edgar et al. (2013) Lowe & Krahn (1995) Martin, Maytham, Case, & Fraser (2010) Nilsson (2010)
	Decision making (n = 3)	Landrum, Hettich, & Wilner (2010) Nicolescu & Păun (2009) Teichler (2007)
	Creativity/Innovation (n = 2)	Biesma, Pavlova, van Merode, & Groot (2007) Evers & Rush (1996)
	Finding optimal solution (n = 1)	Abrandt Dahlgren, Hult, Dahlgren, Hård af Segerstad, & Johansson (2006)
	Having an achievement orientation (n = 1)	Edgar et al. (2013)
	Logical reasoning (n = 1)	Nilsson (2010)
	Learning skills (n = 10)	Edgar et al. (2013) Edvardsson Stiвне & Jungert (2010) Evers & Rush (1996) Johansson, Kopciwicz, & Dahlgren (2008) Lindberg (2010) Martin, Maytham, Case, & Fraser (2005)

	McMurray, Roberts, Robertson, & Teoh (2011) Nicolescu & Păun (2009) Nilsson (2010) Zuccheromaglio & Alby (2009)
Time management/Setting priorities (n = 6)	Edvardsson Stiwne & Jungert (2010) Evers & Rush (1996) Landrum, Hettich, & Wilner (2010) Nilsson (2010) Teichler (2007) Zuccheromaglio & Alby (2009)
Managing self (n = 5)	Edvardsson Stiwne & Jungert (2010) Evers & Rush (1996) Landrum, Hettich, & Wilner (2010) Lindberg (2010) Lowe & Krahn (1995)
Critical thinking (n = 5)	Abrandt Dahlgren, Hult, Dahlgren, Hård af Segerstad, & Johansson (2006) Dyess & Sherman (2009) Edgar et al. (2013) Lindberg (2010) Nilsson (2010)
Career competences (n = 3)	Bridgstock (2011) Kuijpers & Meijers (2012) McMurray, Roberts, Robertson, & Teoh (2011)
Being flexible (n = 3)	Abrandt Dahlgren, Hult, Dahlgren, Hård af Segerstad, & Johansson (2006) Biesma, Pavlova, van Merode, & Groot (2007) Nilsson (2010)
Managing stress/workload (n = 3)	Edvardsson Stiwne & Jungert (2010) Lindberg (2010) Teichler (2007)
Working independently (n = 2)	Landrum, Hettich, & Wilner (2010)

		Nicolescu & Păun (2009)
	Ability to reflect (n = 1)	Abrandt Dahlgren, Hult, Dahlgren, Hård af Segerstad, & Johansson (2006)
	Acting responsible (n = 1)	Landrum, Hettich, & Wilner (2010)
	Possessing self-discipline (n = 1)	Landrum, Hettich, & Wilner (2010)
	Managing tasks at once (n = 1)	Landrum, Hettich, & Wilner (2010)
	Having a clear vision (n = 1)	Evers & Rush (1996)
	Taking risks (n = 1)	Evers & Rush (1996)
	Being structured (n = 1)	Nilsson (2010)
	Handling night duty (n = 1)	Lindberg (2010)
People competences	Communication (n = 10)	Abrandt Dahlgren, Hult, Dahlgren, Hård af Segerstad, & Johansson (2006)
		Baytiyeh & Naja (2012)
		Biesma, Pavlova, van Merode, & Groot (2007)
		Edgar et al. (2013)
		Evers & Rush (1996)
		Johansson, Kopciwicz, & Dahlgren (2008)
		Lowe & Krahn (1995)
		Martin, Maytham, Case, & Fraser (2005)
		McMurray, Roberts, Robertson, & Teoh (2011)
		Nicolescu & Păun (2009)
	Working in teams (n = 8)	Biesma, Pavlova, van Merode, & Groot (2007)
		Edgar et al. (2013)
		Landrum, Hettich, & Wilner (2010)
		Lindberg (2010)
		Lowe & Krahn (1995)
		Martin, Maytham, Case, & Fraser (2005)
		Nicolescu & Păun (2009)
		Yan, Gao, & Lam (2013)
	Interpersonal skills (n = 6)	Edgar et al. (2013)
		Evers & Rush (1996)
		Landrum, Hettich, & Wilner (2010)

	Lindberg (2010)
	Lowe & Krahn (1995)
	Martin, Maytham, Case, & Fraser (2005)
Management skills (n = 6)	Dyess & Sherman (2009)
	Evers & Rush (1996)
	Lindberg (2010)
	Lowe & Krahn (1995)
	Teichler (2007)
	Martin, Maytham, Case, & Fraser (2005)
Leadership (n = 4)	Dyess & Sherman (2009)
	Edgar et al. (2013)
	Martin, Maytham, Case, & Fraser (2005)
	Teichler (2007)
Maintaining relations (n = 2)	Landrum, Hettich, & Wilner (2010)
	Lindberg (2010)
Multidisciplinary work (n = 1)	Martin, Maytham, Case, & Fraser (2005)
Negotiation (n = 1)	Teichler (2007)
Listening skills (n = 1)	Evers & Rush (1996)

Although a variety of knowledge, skills, and attitudes are considered important by students, graduates, and employers in the preparation stage of the transition from higher education to the labour market, some studies indicated that employers do not hold the development of knowledge, skills, and attitudes high for higher education graduates. For example, Edgar et al. (2013) showed that interest and personality are seen as key attributes by graduate recruiters, Bridgstock (2011) indicated that for graduates in the creative industry, motivation is the most important for career success after the transition and Nicolescu and Păun (2009) showed that employers pay most attention to the psychical and moral qualities of the candidate, as well as to professional experience. In addition to these personal factors, the certificate or diploma itself plays a major role in the transition process and, according to Nicolescu and Păun (2009), is sometimes valued more than the real level of competence because it is seen as an indicator of knowledge, skills, and attitudes (Edvardsson Stiwne & Jungert, 2010).

Transfer of learning outcomes (RQ 1b). The knowledge, skills, and attitudes described earlier (see Table 2) provide an overview of what should ideally be learned in education to be fully prepared for the labour market. In our subsequent research question, we wanted to get insight into how graduates put those knowledge, skills, and attitudes into practice at work in the encounter and adjustment stage. Graduates did indicate that it is difficult for them to apply what has been learned in higher education and in the workplace (Le Maistre & Paré, 2004; Pennbrant et al., 2013). However, one study pointed out that graduates experienced that the degree in which they felt competent for their job varied during the process (Renn & Hodges, 2007). They did feel competent to handle the new job at the very beginning of their employment (i.e., encounter stage), but this feeling changed into feelings of incompetence after a short period (i.e., adjustment stage) and stayed until the graduate felt settled in the job (i.e., stabilisation stage) (Renn & Hodges, 2007). As the transition process entails a passing from one context (higher education) to another context (labour market), the knowledge, skills, and attitudes learned in education need to be transformed so that they can be used in the work context. This transformation is necessary because of the different nature of the contexts: While higher education is a rather static context with fixed tasks in a more or less controlled environment, the work context is often more dynamic and unpredictable in nature (Nilsson, 2010). Furthermore, higher education is oriented towards learning, while the work context is generally oriented towards production by means of (quickly)

using knowledge (Garraway, Volbrecht, Wicht, & Ximba, 2011). To summarise, results showed that more ‘theoretical’ knowledge of higher education needs to be transformed into ‘practical’ knowledge that can be used in the workplace, which implies a focus on mastering the professional role (Filstad & McManus, 2011; Graham et al., 2014; Pennbrant et al., 2013; Yan et al., 2013). This transition process appeared to be smoother for some disciplines, due to the degree in which knowledge, skills, and attitudes could be transferred to the work context (Abrandt Dahlgren, Reid, Dahlgren, & Petocz, 2008). Graduates in psychology and graduates in medical sciences, for example, indicated that they experienced continuity between their education and their work (Abrandt Dahlgren et al., 2006; Nilsson, 2010), though medical graduates indicated that the invested amount of time on specific topics in education was not in proportion to the occurrence of these topics in their work (Nilsson, 2010). Engineering graduates experienced mainly discontinuity between their educational background and their work and they indicated that their education focused on topics that are too narrow (Abrandt Dahlgren et al., 2006; Nilsson, 2010). Finally, graduates in political sciences and graduates in chemistry indicated that their transition process is characterised by narrowing the generic competences of education to specific competences necessary in the workplace (Abrandt Dahlgren et al., 2006; Garraway et al., 2011). In addition to transforming the knowledge from education to knowing how to use this in the workplace, several primary studies found that some additional knowledge, skills, and attitudes that cannot be learned in higher education, need to be developed in order to function as a full member of the workplace. This mainly concerns knowledge about the job, such as how to earn social support and which (unwritten) rules apply in the workplace (Filstad & McManus, 2011; Holden & Hamblett, 2007; Le Maistre & Paré, 2004; Pennbrant et al., 2013).

Learning at work (RQ 1c). As mentioned, certain knowledge, skills, and attitudes have to be learned at work (e.g., specific job-related rules or conventions) during the encounter, adjustment, as well as the stabilisation stage (e.g., Holden & Hamblett, 2007). Lowe and Krahn (1995) showed that 40% of their sample across disciplines were convinced that additional training is required to do their job properly. Furthermore, higher educated graduates appeared to have a participation rate in training at work that is higher than average (Lowe & Krahn, 1995). However, graduates indicated that the

training at work must exceed what is learned in education and not entail merely repetition, in order to be useful in the workplace (Yan et al., 2013). In the primary studies, two different antecedents and five consequences were found. Firstly, the context of employment as an antecedent played a major role in stimulating participation in learning: When graduates experienced more autonomy and more workload in their work, they learned more at work (De Witte, Verhofstadt, & Omey, 2007). The combination of high workload and high autonomy caused even more learning (De Witte et al., 2007). Secondly, the educational background appeared to be an antecedent of participation in learning at work. More participation in learning occurred when graduates are employed in a field outside their educational field in combination with employment above or below their level of education, although other mismatches (i.e., having a job outside the field of education or having a job above/below their educational level) had no impact on participation (Heijke et al., 2003). Furthermore, graduates with a higher level of generic competences participated more in training, while a higher level of vocational competences did not have an effect on participation (Heijke et al., 2003).

Besides the factors that promoted learning on the job for recent graduates (i.e., antecedents of learning), several consequences of learning were found in the transition period. It was shown that participation in learning is positively related to wages (Heijke et al., 2003), role clarity, and commitment (Kowtha, 2011). Finally, participation in training had no impact on role orientation, but was related to role conflict (Kowtha, 2011).

3.2 Fit between Educational Background and Work

The second research question refers to the fit that graduates experience when entering the labour market. Thirty-five studies on the transition from higher education to the labour market took at least one type of fit into account. Twenty-eight studies provided results on the different types of fit and the occurrence of these types of fit. An overview of the results on the (occurrence of) types of fit will be presented. Furthermore, the results will point to characteristics of the (personal) background that influence (mis)fit and consequences of perceived fit.

Types of fit (RQ 2a). Different types of fit were found in the literature. Firstly, several studies investigated the *vertical fit* between the educational background and the job (e.g., Ama, 2008; Baert et al., 2013; Maxwell & Broadbridge, 2014). The incidence of vertical fit is reported in eight studies and varied between 42% and 85% (Ama, 2008; Baert et al., 2013; Finnie, 2004; Giret, 2011; Lowe & Krahn, 1995; Maxwell & Broadbridge, 2014; Teichler, 2007; Verhaest & Omey, 2003). Furthermore, the studies focusing on overeducation reported an incidence that varied between 20% and 53.6% (Baert et al., 2013; Finnie, 2004; Lowe & Krahn, 1995; Verhaest & Omey, 2003).

Besides the vertical fit that graduates experience between their level of education and the level required for the job, the *horizontal fit* is considered important (Ama, 2008; Heijke et al., 2003; Teichler, 2007). The occurrence of horizontal fit, based on three studies, varied between 38% and 82% (Ama, 2008; Heijke et al., 2003; Teichler, 2007). It can be noted that the incidence of vertical and horizontal fit largely differed across the different studies. When comparing the different studies, it becomes apparent that these studies differed in the type of measurement used to determine fit, the moment of determining fit, the investigated study discipline, and the different levels of education (e.g., bachelor programmes, master programmes) (e.g., Finnie, 2004; Giret, 2011; Verhaest & Omey, 2003). However, no consistent patterns regarding these differences and the incidence of fit could be identified as potential causes, due to large differences in the characteristics of the primary studies.

Thirdly, the fit between the *competence* level of the graduate and the required competences of the job came to the fore. Besides the horizontal and vertical fit, the question arises as to whether graduates are prepared for the labour market concerning the developed competences. Sixteen studies focused on the fit at the competence level and drew contrasting conclusions. Finnie (2004) and Yan et al. (2013) indicated that the competences learned in higher education and the competences needed in the labour market had a quite high overlap and thus matched. In contrast, Dyess and Sherman (2009) and Evers and Rush (1996) concluded that the supply of skills and the demand for skills did not match and that graduates felt that their skills were insufficient. Giret (2011) indicated that 31% of the vocational bachelor graduates and 40% of the general bachelor graduates (three years after graduation) were in a job that did not utilise all of their skills. According to Bonassi and Wolter (2002) and Teichler (2007),

20% of the graduates perceived that the competences acquired were not useful for their current employment.

While some studies investigated the overall preparedness of graduates in terms of competences (e.g., Dyess & Sherman, 2009; Evers & Rush, 1996; Teichler, 2007), 11 studies identified the concrete competences for which graduates experience (mis)fit between the competences developed in education and the competences expected at work. An outline of the (un)preparedness of the development of particular competences can be found in Table 3.

Basic competences (1). Only three studies reported the level of preparedness concerning basic competences. According to Johansson et al. (2008), *language skills* are underdeveloped when entering the labour market. Contrasting results were found concerning the preparedness on *computer knowledge and skills*, as the study of Teichler (2007) indicated that computer skills are not sufficiently developed, while the study of Nicolescu and Păun (2009) indicated that employers are satisfied with the computer knowledge of recent graduates.

Business competences (2). The most mentioned skill referring to a competence (mis)fit is the lack of practical skills, as six of the 11 studies focusing on the preparedness of particular competences reported a lack of *practical experience* (Garraway et al., 2011; Le Maistre & Paré, 2004; Martin et al., 2005; Nicolescu & Păun, 2009; Pennbrant et al., 2013; Yan et al., 2013). Next to this, opinions differed on the preparedness in terms of *theoretical knowledge*. Teichler (2007) showed that the field-related theoretical knowledge of graduates sufficed and Yan et al. (2013) showed that social work graduates think their theoretical background is a solid foundation for their work. In contrast, Lindberg (2010) stated that physician graduates experienced a lack of attention to theoretical knowledge and skills, more specifically medical knowledge and skills, in their education. Graduates in mechanical engineering indicated five years after graduation that they did not obtain enough knowledge about the specific field they are working in during education (Martin et al., 2005). Lastly, one study indicated that graduates felt prepared concerning *technical competence* (Martin et al., 2005).

Conceptual competences (3). Three studies investigated the preparedness of graduates on conceptual competences. Evers and Rush (1996) and Nicolescu and Păun (2009) concluded that the

skills of graduates concerning *innovation and change* were not developed in line with the expectations of employers. Concerning *decision-making*, it was concluded that graduates are convinced that this should be more developed (Nicolescu & Păun, 2009; Teichler, 2007). While problem-solving is a skill that was frequently studied as important for graduates, only one study investigated the preparedness on *problem-solving* and concluded that recent graduates expected to be more developed regarding solving problems adequately (Nicolescu & Păun, 2009).

Personal competences (4). Graduates are not in agreement about their preparation on *learning skills*. One study reported that graduates in political sciences think that their education should provide them with more lifelong learning skills (Johansson et al., 2008), while another study concluded that graduates in engineering think their lifelong learning skills are sufficient (Martin et al., 2005).

Two studies indicated that graduates feel unprepared to *manage stressful situations* and heavy *workload* (Lindberg, 2010; Teichler, 2007). This feeling of lacking skills was also found for *time management* (Teichler, 2007) and for *critical thinking* (Lindberg, 2010). One study indicated that graduates do feel prepared to *work independently* and to *adapt easily* to changing work conditions (Nicolescu & Păun, 2009).

People competences (5). Concerning the desired development of people competences, most attention was given to *leadership* and *management skills*. Graduates think their education should have paid more attention to leadership and management skills because they are frequently expected to take leading roles when entering the labour market (Dyess & Sherman, 2009; Lindberg, 2010; Martin et al., 2005; Teichler, 2007).

Based on one study, there was no consensus about the sufficiency of the development of graduates' skills of *working in teams* (Martin et al., 2005), while it was shown that, according to graduates, skills related to *communication* are sufficiently developed before leaving higher education (Martin et al., 2005; Nicolescu & Păun, 2009). Also, the knowledge and skills to *build and maintain relationships* with patients for medical graduates were appropriate for entry into the workplace (Lindberg, 2010). However, graduates did not feel ready to *work in a multidisciplinary way*, and to include different views

of different stakeholders (Martin et al., 2005). *Negotiation* needs to be enhanced to be able to function properly in the job of recent graduates (Teichler, 2007).

Table 3
Competence (Mis)fit

Cluster	Competence	Fit	Misfit
Basic competences	Computer skills/Information technology (n = 2)	Nicolescu & Păun (2009)	Teichler (2007)
	Language skills (n = 1)		Johansson, Kopciwicz, & Dahlgren (2008)
Business competences	Theoretical knowledge (n = 5)	Nicolescu & Păun (2009) Teichler (2007) Yan, Gao, & Lam (2013)	Lindberg (2010) Martin, Maytham, Case, & Fraser (2005)
	Practical skills (n = 6)		Garraway, Volbrecht, Wicht, & Ximba (2011) Le Maistre & Paré (2004) Martin, Mayham, Case, & Fraser (2005) Nicolescu & Păun (2009) Pennbrant, Skyvell Nilsson, Öhlén, & Rudman (2013) Yan, Gao, & Lam (2013)
	Technical competences (n = 1)	Martin, Maytham, Case, & Fraser (2005)	
	Problem-solving (n = 1)		Nicolescu & Păun (2009)
Conceptual competences	Decision making (n = 2)		Nicolescu & Păun (2009) Teichler (2007)
	Creativity/Innovation (n = 2)		Evers & Rush (1996) Nicolescu & Păun (2009)
	Learning skills (n = 2)	Martin, Maytham, Case, & Fraser (2005)	Johansson, Kopciwicz, & Dahlgren (2008)
Personal competences	Time management/Setting priorities (n = 1)		Teichler (2007)
	Critical thinking (n = 1)		Lindberg (2010)
	Managing stress/workload (n = 2)		Lindberg (2010) Teichler (2007)

People competences	Working independently (n = 1)	Nicolescu & Păun (2009)
	Adapting to change (n = 1)	Nicolescu & Păun (2009)
	Communication (n = 2)	Martin, Maytham, Case, & Fraser (2005) Nicolescu & Păun (2009)
	Working in teams (n = 1)	Martin, Maytham, Case, & Fraser (2005)
	Management skills (n = 4)	Dyess & Sherman (2009) Lindberg (2010) Martin, Maytham, Case, & Fraser (2005) Teichler (2007)
	Leadership (n = 3)	Dyess & Sherman (2009) Martin, Maytham, Case, & Fraser (2005) Teichler (2007)
	Maintaining relations (n = 1)	Lindberg (2010)
	Multidisciplinary work (n = 1)	Martin, Maytham, Case, & Fraser (2005)
	Negotiation (n = 1)	Teichler (2007)

Finally, the fourth group of fit considers the *person-environment* fit (Edgar et al., 2013; Koen et al., 2012; Sortheix, Dietrich, Chow, & Salmela-Aro, 2013; Sung et al., 2011). The fit between the person and the environment was seen as an important condition in the search for work both by graduates and by employers (e.g., Renn & Hodges, 2007). Edgar et al. (2013) reported that 55% of their sample of employers based their selection of employees on their own assessment of the person-organisation fit. Despite the importance of fit for finding an optimal job, Renn and Hodges (2007) indicated that graduates make their assessment of fit (and thus the decision whether or not they will look for another job) during the stabilisation period and not when starting in the position.

The experienced fit between the (educational) background and the job can play a major role in the *search for a job* (e.g., Renn & Hodges, 2007). Many students or recent graduates have high career aspirations and an active job search behaviour when starting their search for jobs, but one study concluded that these aspirations do fade away after a while and change into lower aspirations and more passive search behaviour (Vuolo, Staff, & Mortimer, 2012). Verhaest and Omeij (2003) indicated that graduates are prepared to take a job two levels below their own level of education. For example, 9.2% of the graduates with a higher education background (with a study duration of three years) were employed in a job that required a lower secondary education diploma.

In the selected studies, four reasons can be found for *accepting a job without a proper fit*. The first reason refers to being forced into taking on a job, no matter what this job is, because graduates cannot wait until they find a job with a proper fit (Ama, 2008; Renn & Hodges, 2007). A second reason is that graduates choose to work in the preferred area (i.e., horizontal fit) and therefore give in on vertical fit (Ama, 2008). Thirdly, graduates indicate that they value other things more than having a good fit, and thus choose a job that is satisfactory for them, but has a low fit (Ama, 2008). The last reason relates to the occupational specificity of their education. Some fields of study appear to be narrow to the extent that graduates cannot find a job in that specific field of study (Ama, 2008; Graham et al., 2014).

Background characteristics influencing fit (RQ 2b). The (personal) background characteristics of the graduate can have an effect on different types of fit and were investigated in 12 studies. Results of Baert et al. (2013) showed that there is a difference in fit between *native and foreign graduates* and that this gap is larger for jobs for which the graduate is overeducated. The *education of the parents* of

the graduate is another personal background characteristic that plays a role in the fit of the graduate: Graduates whose parents have a diploma in higher education, more frequently end up in jobs with a higher vertical fit than graduates where neither of their parents has obtained a diploma in higher education (Opheim, 2007). Furthermore, four studies investigated the role of *gender* in becoming employed in a job that fits the graduate (e.g., Finnie, 2004; Maxwell & Broadbridge, 2014), although the studies did not agree on the effect of gender. Finnie (2004) showed that no pattern can be found between men and women concerning vertical fit, while Maxwell and Broadbridge (2014) found that men experience a higher vertical fit than women. Verhaest and Omey (2003) indicated that women had a higher fit concerning level of education than men. Roksa and Levey (2010) presented a nuanced view on the effect of gender. The authors found that the effect of gender depends on the educational field: For graduates in fields of study that are very specific, there is no difference between men and women. Women appear to benefit more than men in fields of study that are more general, like social sciences or journalism (Roksa & Levey, 2010).

Furthermore, the educational background of the graduate influenced the fit (e.g., Bonassi & Wolter, 2002; Heijke et al., 2003; Roksa & Levey, 2010). The *study discipline* played a role in fit, as demonstrated by Roksa and Levey (2010). Graduates with a vocational educational background in higher education experienced a higher fit than graduates with a general educational background in higher education, indicating that specificity of education can influence vertical and horizontal fit (Giret, 2011; Heijke et al., 2003; Roksa & Levey, 2010). Regarding horizontal fit, graduates from law, natural sciences, and health were more frequently employed in their own study discipline than graduates from other study disciplines (Heijke et al., 2003). Graduating in humanities increases the chance of a lower vertical fit, compared to other disciplines (Opheim, 2007). The *level of education* was another important aspect of education related to fit. Graduates with a master level have generally a higher probability of being overeducated, while lower educational levels have lower rates of being undereducated (Finnie, 2004; Verhaest & Omey, 2003). The degree of *attendance* in education (i.e., full time or part time) turned out to have no effect on vertical fit (Bonassi & Wolter, 2002). Furthermore, *work experience*, particularly in line with the study discipline, led to a better vertical and horizontal fit (Baert et al., 2013;

Graham et al., 2014; Heijke et al., 2003). Furthermore, the degree to which the graduates were able to *adapt themselves to new situations* (e.g., work conditions) affected the horizontal fit and person-environment fit experienced in the transition (Heijke et al., 2003; Koen et al., 2012).

Consequences of fit (RQ 2c). Results of seven primary studies regarding the consequences of fit indicate that the degree of perceived fit did have an influence on the start of the career of the graduate, the career progress, and personal resources. Graduates in a study discipline with a high specificity (which is mainly directed at finding a job with a good horizontal fit) found work more quickly and easily than graduates from study disciplines with a low specificity (Kogan & Unt, 2008). Employers did value a higher person-environment fit when selecting a recent graduate (Edgar et al., 2013). Concerning *career progress*, two studies focused on wages. Heijke et al. (2003) found that a low horizontal fit led to a decrease in wages and Bonassi and Wolter (2002) indicated that a job that requires a higher educational level leads to higher wages, even if the graduate is undereducated. Furthermore, it was argued that starting in a job for which the graduate is overeducated will not lead to more career progress than graduates who immediately started in a job with vertical fit. On the contrary, a first study on this topic indicated that overeducation will not serve as a stepping stone, but as a trap (Baert et al., 2013). Lastly, fit can have an influence on *personal resources*. The absence of horizontal fit is shown to have a moderating effect between co-worker support and supervisor support on the one hand and role clarity and role conflict on the other hand (Kowtha, 2011). A higher person-environment fit was also related to a higher engagement (Sortheix et al., 2013), more goal setting, self-regulated learning, and career exploration (Sung et al., 2011).

4. Discussion

This systematic review study focused on the role of learning and the role of fit in the different stages of the transition process from higher education to the labour market. The study started from the model of Nicholson (1990) to capture the process of transition. We argued that learning takes a prominent role in the transition process and it was stated that the fit between the educational background

of the graduate and work environment cannot be ignored when focusing on the transition from education to work. In the following sections, the main findings and implications are highlighted and discussed.

4.1 Conclusions and Implications for Practice

The role of learning in the transition from higher education to the labour market. Students are expected to improve knowledge, skills, and attitudes during higher education in order to be fully prepared for the transition. The results indicated that competences from every cluster of the competences framework of Young and Chapman (2010) were expected to be developed before entering the labour market. Nevertheless, personal competences, such as communication skills and teamwork skills, were frequently stressed in the primary studies as important and as the most useful knowledge, skills, and attitudes to develop (e.g., Evers & Rush, 1996). However, most primary studies on learning outcomes based their conclusions on the views of students/graduates (e.g., Lindberg, 2010). For employers, in contrast, the personal competences cluster is the cluster of competences that was least emphasised (e.g., Biesma et al., 2007). Although only a small number of primary studies ($n = 3$) focused on the view of employers on learning outcomes, it can be stated that different (clusters of) competences are stressed in comparison with the views of students or graduates (e.g., Evers & Rush, 1996).

These differences and the wide range of knowledge, skills, and attitudes that should be developed entail a challenge for higher education institutions to cultivate all necessary knowledge, skills, and attitudes in one curriculum (Ama, 2008). This adds to the debate on the degree to which higher education should adapt the curriculum to the needs of employers (Teichler, 1999). As graduates from one study discipline can apply for a wide range of jobs and, as most vacancies can be filled by graduates from different study disciplines, the one-on-one relationship between education and job is absent (e.g., Kuijpers & Meijers, 2012).

Therefore, educators could focus on generic competences that can be transferred to different contexts. The results of this systematic review study indicated that generic competences are more frequently mentioned as important competences to develop before entering the labour market (e.g., Evers & Rush, 1996). Therefore, the results are in favour of a system wherein education does not totally

adapt the curriculum to the demands of employers, but prepares students to take an active and learning role in their future work (Teichler, 1999). In that sense, higher education should try to provide students with a broad basis and to increase their employability for a wide range of jobs.

Besides the broad conclusion that generic competences are mentioned as most important, it can be stated that these particular competences function as a basis and thus contribute to a large extent to the employability of students in different jobs. Firstly, *theoretical knowledge* came to the fore: 10 studies showed that a solid theoretical foundation is a large help when entering the labour market (e.g., Biesma et al., 2007). It is argued that theoretical knowledge needs to be developed as it provides graduates with a prior knowledge base in order to develop other – mostly generic – competences (Lindberg, 2010). Secondly, 10 studies indicated that *problem-solving* is important when entering the labour market (e.g., Evers & Rush, 1996). While higher education is often directed to learning and analysing problems, the context of work is mainly oriented to doing and producing (Garraway et al., 2011). Problem-solving skills integrate both orientations, as problem-solving entails learning and analysing the problem and afterwards producing and doing, explaining the relative importance of this skill. Thirdly, *communication* arose as an important skill in the transition process (e.g., Martin et al., 2005). Communication is a generic people competence, but also serves as a basis for other competences (Landrum et al., 2010). For example, it is not possible to develop skills like negotiation, working in teams, and people management without solid communication skills. Lastly, 10 studies referred to the *lifelong learning skills* as important skills to develop when entering the labour market (e.g., Edvardsson Stiwné & Jungert, 2010). As the labour market is quickly developing and requires different knowledge, skills, and attitudes from graduates, learning in new areas and updating what is learned are obvious skills to develop (Tynjälä, 2008). Although the results indicated that higher education should contribute to the broader employability of students, it could be argued that the emphasis on generic competences could also be due to characteristics of the studies retained in the review. As most research on the transition from higher education to the labour market focused on a variety of different study disciplines of graduates (e.g., Kogan & Unt, 2008), it could be expected that those studies devote more attention

to generic competences as their main characteristic is that they can be developed in every study discipline, in contrast to specific competences (e.g., Heijke et al., 2003).

Regarding the research question on transfer of learning outcomes, results pointed to the difficulty of transfer in the transition from higher education to the labour market (e.g., Le Maistre & Paré, 2004). It is not always easy for recent graduates to transfer all knowledge, skills, and attitudes as education is mainly directed to learning, whereas the focus at work is on using these learning outcomes. Results showed that the transfer of knowledge, skills, and attitudes was predominantly experienced in three different ways (e.g., Abrandt Dahlgren et al., 2006; Nilsson, 2010). Firstly, in some situations graduates can experience continuity between their educational background and their job on content level (Abrandt Dahlgren et al., 2006). Secondly, discontinuity can be experienced, indicating that the graduate will need to learn a set of new knowledge, skills, and attitudes at work (Nilsson, 2010). Thirdly, other graduates indicated that the transfer primarily entails a process of detailing the learning outcomes from education in order to use them at work (Abrandt Dahlgren et al., 2006). It can be hypothesised that the experienced transfer depends on the nature of higher education. When education focuses on educating graduates who can function in a wide range of jobs, a mere continuity between education and the job will not exist. Hence, if education wants to prepare graduates for different career paths, the main task would be to prepare students to handle the process of discontinuity or detailing. More research is needed to determine how education can support students in dealing with these processes.

In all three cases (continuity, discontinuity, and detailing) the recent graduate will need to develop additional knowledge, skills, and attitudes at work. A main conclusion is that graduates are convinced that their knowledge, skills, and attitudes should be further developed at work, but that these learning activities should exceed their prior knowledge (developed in higher education) (Yan et al., 2013). Furthermore, results showed that what has to be learned goes further than the mere knowledge, skills, and attitudes that can be provided by education (e.g., Filstad & McManus, 2011). As the results showed that education should primarily focus on generic competences, another practical implication is that the workplace will need to support graduates to develop more specific competences at work and to enlarge the development of (these generic) competences.

The role of fit between (educational) background and the job. In our systematic review study, four types of fit could be distinguished in the transition from higher education to work: vertical fit (e.g., Verhaest & Omeij, 2003), horizontal fit (e.g., Ama, 2008), competence fit (e.g., Nicolescu & Păun, 2009), and person-environment fit (e.g., Sortheix et al., 2013), although this last type is less frequently studied in the transition. As this review showed that all types of fit could be distinguished in the transition from higher education to work, it is important that educators take into account that graduates can take countless paths when entering the labour market. In order to assist graduates in making career choices, it can be suggested to educators to pay attention to the different possibilities by offering students career guidance (Kuipers & Meijers, 2012).

4.2 Implications for Theory and Future Research

This systematic review contributes to the research field in providing an overview of the literature on the transition from higher education to the labour market with a specific focus on the role of learning and the role of fit. Before discussing the implications for theory and the resulting suggestions for future research, an overarching point of discussion arises. Starting from the process-based approach, the framework of Nicholson (1990) was used in this study to emphasise the different stages of a transition process. While the different stages in the transition can be considered as important, only nine studies that were included in the analysis used more than two measurement moments in their study (e.g., Bridgstock, 2011). In that sense, literature on the transition from higher education to the labour market currently sheds insufficient light on the different stages that are important in the transition. Therefore, we argue that in order to grasp fully the transition conceptualised as a process, in line with the call of Teichler (2007), more longitudinal research on the transition from higher education to the labour market is indispensable.

The role of learning in the transition from higher education to the labour market. This study provided an overview of all described learning outcomes that should be ideally developed to enter

the labour market. Although general conclusions can be drawn from this overview, it should be noted that different study disciplines were taken into account in the primary studies. Subsequently, an obvious question would be whether different patterns could be detected for the study disciplines. Therefore, it was considered whether the knowledge, skills, and attitudes could be linked to specific study disciplines. As Appendix D indicates, no apparent trends were detected between the different study disciplines. In line with these, the primary studies were conducted in different countries and thus we compared learning outcomes of different educational systems. It could be assumed that the necessary knowledge, skills, and attitudes will differ based on the specificities of the educational systems (Kogan & Unt, 2011). However, the number of studies per country was too low to detect whether differences could be found in the primary studies. The detection of potential differences between countries would be an interesting follow-up question for future research, when the literature on the transition from higher education to the labour market is expanded.

While this study focused on learning outcomes and activities during the transition process, it was noted that opportunities to learn and to develop themselves personally were also considered in one study to be an outcome of the transition process (Teichler, 2007). In line with this, Baytiyeh and Naja (2012) stated that a smooth transition means that the talents and interests of graduates fully blossom in the job. However, other studies approached a smooth transition as a quick job entry or a high starting wage (e.g., Kogan & Unt, 2008). Although it was not the aim of the study, it was noticed that it is frequently assumed in the primary studies that the outcome of the transition process has to be a ‘smooth’ transition, although a clear definition of a smooth transition is lacking. Therefore, it is suggested that future research clearly defines the concept and addresses the different aspects of a smooth transition as perceived by graduates, employers, and educators.

Furthermore, the review study included different perspectives of stakeholders in the transition process. While research is needed to grasp the subjective interpretation of young graduates (Graham et al., 2014), it is also important to acknowledge that both higher education and employers have a vital role to play (Le Maistre & Paré, 2004). It can be concluded that, in the included primary studies, the perspective of educators and the perspective of employers has received less attention compared to the

perspective of students/graduates. Therefore, in order to capture the entire transition, we suggest that future research includes the perspective of education and/or employers on top of the perspective of young adults and compares these perspectives in order to explore (mis)matches concerning expectations and experiences of the different stakeholders in the transition from higher education to the labour market.

The role of fit in the transition from higher education to the labour market. It can be noted that the reported incidences of vertical and horizontal fit were varied across the primary studies. Moreover, further analysis did not provide decisive answers about the reasons for this wide range. A first possible reason could be the used measurement type. Previous research has indicated that the determination of fit is a complex matter (Renn & Hodges, 2007; Verhaest & Omeij, 2003) and that using different measurement methods (i.e., objective or subjective measurements of fit) lead to different outcomes on the incidence of fit (Humblet, 2007). As the different primary studies used different measurement methods (e.g., Baert et al., 2013; Finnie, 2004), it is difficult to compare the results on the incidence of fit. Secondly, the moment of determining fit varied across studies from the first moment in the job until after eight years of work (e.g., Ama, 2008). It can be expected that the assessment of fit, particularly when using self-report measures, can change when gaining more experience in a certain job, as (mis)fit cannot be considered as a permanent state (Leuven & Oosterbeek, 2011). Thirdly, different study disciplines were taken into account in the primary studies. While some studies included a range of disciplines (e.g., Teichler, 2007), other studies focused on graduates from one specific study discipline (e.g., Maxwell & Broadbridge, 2014). The results of the research of Giret (2011) suggested that the incidence of vertical fit depends on the study disciplines, as graduates of more specifically oriented disciplines reported a higher fit than graduates from more general oriented disciplines. Lastly, while every study focused on higher education, some studies focused on specific programmes (i.e., bachelor or master programmes) and other studies considered the broad field of higher education (e.g., Baert et al., 2013). One primary study indicated that results can vary for different levels: graduates from master programmes reported a lower vertical fit than graduates from bachelor programmes (Finnie,

2004). To summarise, different possible explanations for the varying incidences of horizontal and vertical fit are proposed, but more research on fit is needed to investigate these differences further. It can be concluded that it is necessary that research on fit clearly describes the background of their study (i.e., measurement type, moment, study discipline, and level of education) in order to clarify the differences in the incidences of fit.

Considering the background characteristics that have an influence on fit and the consequences of fit, results of the primary studies showed that a variety of characteristics can impact the perceived fit and that the level of perceived fit can have consequences at a later stage. However, it is interesting to note that most characteristics are often investigated in a single study. Gender is a background characteristic that has been studied more often, but the results suggest contradictory conclusions (Maxwell & Broadbridge, 2014; Roksa & Levey, 2010). Therefore, it can be concluded that more research is needed on both the background characteristics influencing fit and on the consequences of fit in order to provide practical implications on this matter.

This systematic review study focused on the role of learning and fit in the transition from higher education to the labour market. It can be noted that only one study explicitly investigated this relationship (Heijke et al., 2003). The authors concluded that the level of specific competences influenced the probability of experiencing a higher horizontal fit and that the level of generic competences influences the probability of finding employment without horizontal fit (Heijke et al., 2003). They concluded that, while a competence fit can lead to increased participation in formal learning activities, a vertical misfit does not lead to more participation in formal learning activities (Heijke et al., 2003). Given the importance of learning, future research is clearly needed to disentangle the relationship between learning and fit in the transition from higher education to the labour market.

4.3 Limitations

Although the search for literature was approached in a systematic way, the review study faced some limitations. The first limitation of our study is that we only included primary studies that mentioned the transition or referred to the transition, such as studies on the entrance to the labour

market. Nevertheless, it is possible that other studies that investigated a specific period in the transition were not included because they did not explicitly refer to the transition period. It can, for example, be noted that we only found one study that focused on the job-searching behaviour of graduates (Verhaest & Omeij, 2003), as we did not include specific search terms on the job-search. However, it can be assumed that job-search is often linked to the transition period, but it was not the main focus of this review. Moreover, we tried to reduce this bias by using a large range of search terms to include studies that did not explicitly mention the transition (e.g., by using search terms such as ‘education to work’). Furthermore, the bias was reduced by starting from a broad search to a narrow one. A second limitation concerned our choice of solely focusing on empirical studies. We decided not to include conceptual, theoretical studies and thus only included results that were empirically investigated. Finally, a typical limitation for systematic review studies entails possible publication bias. This study focused on published studies because of the difficulty of retrieving unpublished work.

The limitations of this study notwithstanding, the results of this systematic review study showed that, over the years, attention was devoted to learning and fit in the transition, but that the field remains largely scattered. Despite this, this work underpins the need to address explicitly different aspects of the entire transition process (Nicholson, 1990), such as the studied transition stage, stakeholders, and outcomes of transition. We acknowledge that it would not be feasible to include every important factor on learning or fit in the transition from education to work. Hence, we have highlighted the need for an explanatory framework in order to grasp the most important facets of the transition from higher education to the labour market.

6. References

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Appendix A

Critical Appraisal Qualitative and Mixed Method Studies

	Type of study*	Was there a clear statement of the aims of the research?	Is a qualitative / mixed methods methodology appropriate?	Was the research design appropriate to address the aims of the research?	Was the recruitment strategy appropriate to the aims of the research?	Were the data collected in a way that addressed the research issue?	Has the relationship between researcher and participants been adequately considered?	Have ethical issues been taken into consideration?	Was the data analysis sufficiently rigorous?	Is there a clear statement of findings?	Overall quality rating
Study		Criteria for appraising qualitative research									
Abrandt Dahlgren, Hult, Dahlgren, Hård af Segerstad, & Johansson, 2006	QL	Y	Y	Y	Y	Y	N	N	Y	Y	H
Abrandt Dahlgren, Reid, Dahlgren, & Petocz, 2008	QL	Y	Y	Y	Y	Y	N	N	Y	Y	H
Baytiyeh & Naja, 2012	MM	Y	Y	Y	N	Y	N	N	Y	Y	M
Dyess & Sherman, 2009	QL	Y	Y	Y	Y	N	Y	N	Y	Y	H
Edgar et al., 2013	QL	Y	Y	Y	Y	Y	N	Y	Y	Y	H
Edvardsson Stiwne & Jungert, 2010	QL	Y	Y	Y	Y	Y	N	N	Y	Y	H
Filstad & McManus, 2011	QL	Y	Y	Y	Y	Y	N	N	Y	Y	H
Garraway, Volbrecht, Wicht, & Ximba, 2011	QL	Y	Y	Y	Y	Y	N	N	Y	Y	H
Graham, Shier, & Eisenstat, 2014	QL	Y	Y	Y	Y	Y	N	Y	Y	Y	H
Holden & Hamblett, 2007	QL	Y	Y	Y	Y	Y	Y	N	Y	Y	H

	Type of study*	Was there a clear statement of the aims of the research?	Is a qualitative / mixed methods methodology appropriate?	Was the research design appropriate to address the aims of the research?	Was the recruitment strategy appropriate to the aims of the research?	Were the data collected in a way that addressed the research issue?	Has the relationship between researcher and participants been adequately considered?	Have ethical issues been taken into consideration?	Was the data analysis sufficiently rigorous?	Is there a clear statement of findings?	Overall quality rating
Johansson, Kopciwicz, & Dahlgren, 2008	QL	Y	Y	Y	Y	Y	Y	N	Y	Y	H
Le Maistre & Paré, 2006	QL	Y	Y	Y	N	N	N	N	Y	Y	M
Lindberg, 2010	MM	Y	Y	Y	Y	Y	Y	N	N	Y	H
Martin, Maytham, Case, & Fraser, 2005	QL	Y	Y	Y	Y	Y	N	N	Y	Y	H
McMurray, Roberts, Robertson, & Teoh, 2011	MM	Y	Y	Y	Y	Y	N	Y	Y	Y	H
Nilsson, 2010	QL	Y	Y	Y	Y	Y	N	N	Y	Y	H
Pennbrant, Skyvell Nilsson, Öhlén, & Rudman, 2013	QL	Y	Y	Y	Y	Y	N	Y	Y	Y	H
Renn & Hodges, 2007	QL	Y	Y	Y	Y	Y	N	N	Y	Y	H
Yan, Gao, & Lam, 2013	QL	Y	Y	Y	Y	Y	Y	Y	Y	Y	H
Zuchermaglio & Alby, 2009	QL	Y	Y	Y	N	Y	N	N	Y	Y	M

*QL = Qualitative study; MM = Mixed method study

Note. Each research study was confronted with every question in the checklist and could be only answered with yes (Y) or no (N). Whenever there was no information available around a specific criterion, it was assumed that the researcher did not take it into consideration. Conclusively, every research was given a quality rating. This rating depended on how they scored on the questions:

- (L) Low: 0-3 times answered yes
- (M) Medium: 4-6 times answered yes
- (H) High: 7-9 times answered yes

If the answers in the first three questions were negative, the study should be excluded, and could be identified as fatally flawed.

Appendix B

Critical Appraisal Quantitative Studies

	Was there a clear statement of the aims of the research?"	Was the research design appropriate to address the aims of the research?	Was the recruitment strategy well described?	Was the sample representative of the source population (no selection bias) and was the response rate acceptable?	Was the selection of explanatory variables based on a sound theoretical basis?	Is the questionnaire valid and reliable?	Have confounding factors been considered?	Is there a clear statement of the findings?	Are the findings generalizable to the source population?	Overall quality rating
Study	Criteria for appraising quantitative research									
Ama, 2008	Y	Y	Y	Y	Y	N	Y	Y	Y	H
Baert, Cockx, & Verhaest, 2013	Y	Y	Y	Y	Y	N	N	Y	Y	H
Biesma, Pavlova, van Merode, & Groot, 2007	Y	Y	Y	Y	Y	Y	Y	Y	Y	H
Bonassi & Wolter, 2002	Y	Y	Y	Y	N	Y	Y	Y	Y	H
Bridgstock, 2011	Y	Y	Y	Y	Y	Y	Y	Y	Y	H
De Witte, Verhofstadt, & Omeij, 2007	Y	Y	Y	Y	Y	Y	Y	Y	Y	H
Evers & Rush, 1996	Y	Y	Y	Y	Y	Y	Y	Y	Y	H
Finnie, 2004	N	Y	Y	Y	N	Y	Y	Y	Y	H
Giret, 2011	Y	Y	Y	Y	N	Y	Y	Y	Y	H
Heijke Meng, & Ris, 2003	Y	Y	Y	Y	Y	Y	Y	Y	Y	H
Koen, Klehe, & Van Vianen, 2012	Y	Y	Y	Y	Y	Y	Y	Y	Y	H
Kogan & Unt, 2008	Y	Y	Y	Y	Y	N	Y	Y	Y	H
Kowtha, 2011	Y	Y	Y	Y	Y	Y	Y	Y	Y	H
Kuijpers & Meijers, 2012	Y	Y	Y	Y	Y	Y	Y	Y	Y	H
Landrum, Hettich, & Wilner, 2010	Y	Y	Y	Y	Y	N	Y	Y	Y	H
Lowe & Krahn, 1995	Y	Y	Y	Y	Y	N	Y	Y	Y	H

Maxwell & Broadbridge, 2014	Y	Y	Y	N	Y	N	Y	Y	Y	H
Nicolescu & Păun, 2009	Y	Y	Y	Y	N	N	Y	Y	Y	H
Opheim, 2007	Y	Y	Y	Y	Y	N	Y	Y	Y	H
Roksa & Levey, 2010	Y	Y	Y	Y	Y	Y	N	Y	Y	H
Sortheix, Dietrich, Chow, & Salmela-Aro, 2013	Y	Y	Y	Y	Y	Y	Y	Y	Y	H
Sung, Turner, & Kaewchinda, 2011	Y	Y	Y	Y	Y	Y	Y	Y	Y	H
Teichler, 2007	Y	Y	Y	Y	Y	N	Y	Y	Y	H
Vuolo, Staff, & Mortimer, 2011	Y	Y	Y	Y	Y	Y	Y	Y	Y	H

Note. Each research study was confronted with every question in the checklist and could be only answered with yes (Y) or no (N). Whenever there was no information available around a specific criterion, it was assumed that the researcher did not take it into consideration. Conclusively, every research was given a quality rating. This rating depended on how they scored on the questions:

- (L) Low: 0-3 times answered yes
- (M) Medium: 4-6 times answered yes
- (H) High: 7-9 times answered yes

If the answers in the first three questions were negative, the study should be excluded, and could be identified as fatally flawed.

Appendix C

Inventory of Study Characteristics

Authors	Year	Country	Method	Discipline	Moment	Participants	Learning			Fit		
							RQ 1a	RQ 1b	RQ 1c	RQ 2a	RQ 2b	RQ 2c
Abrant Dahlgren, Hult, Dahlgren, Hård af Segerstad, & Johansson	2006	Sweden	Qualitative interviews	Political Sciences Psychology	During the last year of education and after approximately 15 – 18 months of professional work <i>Two measurement moments</i>	N = 24	X	X				
Abrandt Dahlgren, Reid, Dahlgren, & Petocz	2008	Sweden Australia	Qualitative interviews Documents regarding educational programs	Political Sciences Psychology Mechanical Engineering Music Education Statistics	Students in their first year Students in their final year <i>One measurement moment</i>	N = 48 N = 200	X	X				
Ama	2008	Botswana	Quantitative Survey	Economics Law Political and Administrative Studies Population Studies Social Work Sociology and Statistics	Graduates between 1986 and 2004 <i>One measurement moment</i>	N = 550				X		

Baert, Cockx, & Verhaest	2013	Belgium	Quantitative Survey	All disciplines	Participants were 23 years old. Follow-up surveys were completed at 26 for cohort 1 and 29 years old for cohort 2 <i>Two measurement moments</i>	N = 1434		X	X	X
Baytiyeh & Naja	2012	Lebanon	Quantitative Survey Qualitative Interviews	Engineers	Graduates who had been practising for no more than 10 years <i>One measurement moment</i>	N = 217 N = 17	X			
Biesma, Pavlova, van Merode, & Groot	2007	The Netherlands	Quantitative Survey	Public Health	Employers of entry-level academic graduates <i>One measurement moment</i>	N = 185	X			
Bonassi & Wolter	2002	Switzerland	Quantitative Survey	Business and Administration	Graduates who graduated one to three years ago <i>One measurement moment</i>	N = 121		X		X
Bridgstock	2011	Australia	Quantitative Survey	Creative Industry	Graduates at course	N = 208	X			

						completion and one year later. <i>Two measurement moments</i>		
De Witte, Verhofstadt, & Omeij	2007	Belgium	Quantitative Survey	All disciplines	Participants were 23 years old. <i>One measurement moment</i>	N = 2212		X
Dyess & Sherman	2009	United States	Qualitative Study with Focus Groups	Nurses	Graduates with less than 12 months of practice experience <i>One measurement moment</i>	N = 81	X	X
Edgar, Cathro, Harrison, Hoek, McKenzie, Malcolm, Polson, Porteous, Robertson, Shewan, Smart, & Tyler-Baxter	2013	New Zealand	Qualitative Interviews	All disciplines	Graduate recruiters <i>One measurement moment</i>	N = 20	X	X
Edvardsson Stiwne & Jungert	2010	Sweden	Qualitative Interviews	Engineering	Participants were interviewed once a year throughout their studied with a follow-up one year after graduation	N = 20	X	

							<i>Five to seven measurement moments</i>		
Evers & Rush	1996	Canada	Quantitative Survey	All disciplines	Students Graduates Managers Professors	N = 1610		X	X
							<i>One measurement moment</i>		
Filstad & McManus	2011	Norway	Qualitative Case Studies, including Interviews, Conversations, Focus Groups and Observations	Office-based positions Paramedics	During the first year of graduates	N = 32		X	
							<i>Two or three measurement moments</i>		
Finnie	2004	Canada	Quantitative Surveys	All disciplines	Two and five years after graduation	N = 26441 (cohort 1) N = 30884 (cohort 2) N = 27937 (cohort 3)			X
							<i>Two measurement moments</i>		
Garraway, Volbrecht, Wicht, & Ximba	2011	South-Africa	Qualitative Case Studies, with Document Analysis Essays Briefing Sessions	Chemistry of and	Students in their internship	N = 18		X	X
							<i>One measurement moment</i>		
Giret	2011	France	Quantitative Survey	All disciplines	Graduates, three years after graduation	N = 789		X	X

					were just graduated <i>One measurement moment</i>			
Kogan & Unt	2008	Estonia Slovenia	Quantitative Survey	All disciplines	Graduates aged 25 – 35 years old and left education within the ten previous years <i>One measurement moment</i>	N = 2841		X X
Kowtha	2011	Korea	Quantitative Survey	Business Engineering	Graduates at the time of graduation, three months later and five months later <i>Three measurement moments</i>	N = 528 N = 380 N = 244	X	X
Kuijpers Meijers	& 2012	The Netherlands	Quantitative Survey	All disciplines	Students in their second and third year and career counsellors <i>Two measurement moments</i>	N = 4820 N = 371	X	
Landrum, Hettich, Wilner	& 2010	United States	Quantitative Survey	Psychology	Graduates of one university in one discipline <i>One measurement moment</i>	N = 78	X	

						<i>One measurement moment</i>		
McMurray, Roberts, Robertson, & Teoh	2011	United Kingdom	Curriculum Audit Focus groups Quantitative Survey	Psychology	Students	N = 77		
						<i>One measurement moment</i>	X	
Nicolescu & Păun	2009	Romania	Quantitative Survey	Business and Economics	Graduates at the moment of graduation	N = 483 N = 472		
						Employers that had as employees graduates in the last three years from all faculties of the university	X	X
						<i>One measurement moment</i>		
Nilsson	2010	Sweden	Qualitative Interviews	Physicians Engineers Information Technology	Graduates who had been working between one and eight months and a follow-up when they had been in employment for at least three years	N = 43		
						<i>One measurement moment</i>	X	X
								X
Opheim	2007	Norway	Quantitative Survey	All disciplines	Graduates, six months after graduation	N = 16320		X

					<i>One measurement moment</i>				
Pennbrant, Skyvell Nilsson, Öhlén, & Rudman	2013	Sweden	Qualitative Research, using Questionnaires	Nurses	Graduates in their first years of work <i>One measurement moment</i>	N = 330	X	X	X
Renn & Hodges	2007	United States	Qualitative Research with Monthly Questions	Student affairs	Graduates who had begun full-time employment <i>One measurement moment</i>	N = 10		X	X
Roksa & Levey	2010	United States	Quantitative Survey	All disciplines	Students when they were 14 – 22 years old. Follow-up each year for 15 years <i>More than ten measurement moments</i>	N = 1970			X X
Sortheix, Dietrich, Chow, & Salmela-Aro	2013	Finland	Quantitative Survey	All disciplines	Students in the third year of upper secondary education and followed-up four times until they were 25 years old <i>Four measurement moments</i>	N = 348			X
Sung, Turner, & Kaewchinda	2011	United States	Quantitative Survey	Mathematics Clothing and	Students	N = 132			X

				material design Study skills	<i>One measurement moment</i>					
Teichler	2007	Austria The Czech Republic Finland France Germany Italy The Netherlands Norway Spain Sweden United Kingdom Japan	Quantitative Survey	All disciplines	Graduates, about three to four years after graduation <i>One measurement moment</i>	N > 12000				
							X		X	X
Verhaest & Omeij	2003	Belgium	Quantitative Survey	All disciplines	Participants were 23 years old <i>One measurement moment</i>	N = 2122			X	X
Vuolo, Staff, & Mortimer	2011	United States	Quantitative Survey	All disciplines	Students in ninth grade, yearly until grade 12. Renewed at age 31 – 32 and two and four years later. <i>Seven measurement moments</i>	N = 1010			X	
Yan, Gao, & Lam	2013	China	Qualitative Interviews	Social work	Graduates who worked in two	N = 28	X	X	X	X

					agencies, who were working between one month and two years <i>One measurement moment</i>	
Zuccheromaglio & Alby	2009	Italy	Document analysis Qualitative Interviews	Economics Engineering Natural Science Law Architecture Literary Studies	Students who participated in the programme at six moments during one year <i>Six measurement moments</i>	N = 92 X

Appendix D

Important Knowledge, Skills, and Attitudes per Study Discipline

Cluster	Competence	All disciplines (n = 7)	Engineering Chemistry (n = 4)	Psychology Social work (n = 4)	Business Economics (n = 1)	Medical studies Nursing (n = 5)	Political sciences (n = 2)	Creative industry (n = 1)
Basic competences	Computer skills/Information technology (n = 4)	2	0	1	1	0	0	0
	Language skills (n = 1)	0	0	0	0	0	1	0
Business competences	Theoretical knowledge (n = 10)	2	2	2	1	3	1	0
	Practical skills (n = 6)	3	1	1	0	2	0	0
	Technical competences (n = 3)	2	1	0	0	0	0	0
Conceptual competences	Problem-solving (n = 10)	2	3	3	1	2	1	0
	Analytical thinking (n = 6)	3	2	1	0	1	1	0
	Decision making (n = 3)	1	0	1	1	0	0	0
	Creativity/Innovation (n = 2)	1	0	0	0	1	0	0
	Finding optimal solution (n = 1)	0	0	1	0	0	1	0
	Having an achievement orientation (n = 1)	1	0	0	0	0	0	0
	Logical reasoning (n = 1)	0	1	0	0	1	0	0
Personal competences	Learning skills (n = 10)	3	3	1	1	2	1	0
	Time management/Setting priorities (n = 6)	3	2	1	0	1	0	0
	Managing self (n = 5)	2	1	1	0	1	0	0
	Critical thinking (n = 5)	1	1	1	0	3	1	0
	Career competences (n = 3)	1	0	1	0	0	0	1
	Being flexible (n = 3)	0	1	1	0	1	1	0
	Managing stress/workload (n = 3)	1	1	0	0	1	0	0
	Working independently (n = 2)	0	0	1	1	0	0	0
	Ability to reflect (n = 1)	0	0	1	0	0	1	0
	Acting responsible (n = 1)	0	0	1	0	0	0	0

	Possessing self-discipline (n = 1)	0	0	1	0	0	0	0
	Managing tasks at once (n = 1)	0	0	1	0	0	0	0
	Having a clear vision (n = 1)	1	0	0	0	0	0	0
	Taking risks (n = 1)	1	0	0	0	0	0	0
	Being structured (n = 1)	0	1	0	0	1	0	0
	Handling night duty (n = 1)	0	0	0	0	1	0	0
People competences	Communication (n = 10)	3	2	2	1	1	2	0
	Working in teams (n = 8)	2	1	2	1	2	0	0
	Interpersonal skills (n = 6)	3	1	1	0	1	0	0
	Management skills (n = 6)	3	1	0	0	2	0	0
	Leadership (n = 4)	2	1	0	0	1	0	0
	Maintaining relations (n = 2)	0	0	1	0	1	0	0
	Multidisciplinary work (n = 1)	0	1	0	0	0	0	0
	Negotiation (n = 1)	1	0	0	0	0	0	0
	Listening skills (n = 1)	1	0	0	0	0	0	0

Note. Studies that did include more than five disciplines were considered as studying “all disciplines”. Studies that are studying more than one discipline (but less than five) are included in every field of discipline they are studying.