Future-proof

INCREASING THE UNDERSTANDING OF WORK-RELATED LEARNING IN THE TRANSITION FROM HIGHER EDUCATION TO WORK

Ilke Grosemans

Doctoral thesis offered to obtain the degree of
Doctor of Educational Sciences (PhD)

Supervisor:
Prof. Dr. Eva Kyndt

Co-supervisor:
Prof. Dr. Liesje Coertjens

2018

KU LEUVEN

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FACULTY OF PSYCHOLOGY AND
EDUCATIONAL SCIENCES

Occupational & Organisational Psychology
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SUMMARY

Given the rapid technological changes and globalisation, all employees are expected to engage in work-related learning, defined as engagement in formal or informal learning activities leading to improvement or acquisition of competences. It has been argued that the largest need to learn is felt by recent graduates, as they will need to cope with the demands of their new job, providing ample challenges and opportunities to learn. In addition, the benefits are larger for recent graduates, as work-related learning can have long-term effects on their career. Despite its importance, prior research devoted little attention to work-related learning of recent graduates. This dissertation aimed to address this gap by increasing the understanding of work-related learning in the transition to work on the one hand and investigating how personal factors and education-job fit can facilitate work-related learning on the other hand.

In a first research stage, insights were obtained on a theoretical level by means of a systematic review (Study 1). This study aimed to get a deeper understanding of learning and education-job fit during the transition to work, based on 45 primary studies. Concerning learning, this study investigated the competences that are necessary for graduates when entering the labour market. Results indicated that most emphasis is put on generic competences. More specifically, theoretical knowledge, problem-solving, communication, and learning skills are valued most. Furthermore, the need for additional learning at work was stressed. Moreover, the study gained insight the different types of fit and their incidences in the transition to work: Vertical, horizontal, competence, and person-environment fit were found to be important types of fit for recent graduates.

In the second research stage, it was empirically investigated how factors within the transition to work facilitate work-related learning. As a first step, an instrument measuring work-related learning activities was developed and validated (Study 2). The instrument was constructed based on a literature review and group discussions among domain experts; and was examined among a heterogeneous sample of employees. Three factors were distinguished and confirmed, namely informal learning activities using personal sources, informal learning activities using environmental sources, and formal learning activities. The results provided solid evidence for the validity and reliability of the developed instrument.

To investigate how factors facilitate work-related learning, a quantitative longitudinal design was used, in which questionnaires were presented five times to students over the course of their final year of higher education and during their first year at work. The role of the development of self-efficacy and achievement goals (as personal factors) in work-related learning was investigated (Study 3). The study took a longitudinal, person-centered approach by examining differences in work-related learning between different motivational profiles, based on the conjoint development of self-efficacy and achievement goals. The results revealed an average increase in self-efficacy, learning-goal, and performance-approach orientation and decrease in performance-avoidance orientation, indicating that the transition to work triggers change in personal factors, which is transferred to the working environment. Four distinct motivational profiles were identified and differences were found concerning work-related learning: Most learning after graduation was reported by graduates who were in the profile characterised by high and increasing self-efficacy, learning-goal, and performance-approach orientation.

A final study focused on the relationship between education-job fit and work-related learning (Study 4). Theoretically, two (contradicting) processes are proposed regarding the relationship, in which fit would either induce or hamper work-related learning. The study assessed these hypotheses by identifying fit-profiles of graduates and investigating differences in work-related learning. The four identified fit-profiles demonstrated differences in work-related learning in favour of the complementing hypothesis, in which graduates with a full education-job fit reported most work-related learning. Moreover, these differences were sustained six months later, indicating that the fit-profile remained to have an effect on work-related learning.

SAMENVATTING

Snelle technologische veranderingen en globalisatie zorgen ervoor dat werkgerelateerd leren, gedefinieerd als deelname aan formele of informele leeractiviteiten leidend tot het verwerven of verbeteren van hun competenties, belangrijk is voor alle werknemers. De grootste nood is te voelen bij pasafgestudeerden, vermits zij moeten omgaan met de eisen van hun nieuwe job – wat uitdagingen en mogelijkheden tot leren met zich meebrengt. Bovendien zijn de voordelen groter voor hen, aangezien werkgerelateerd leren langetermijneffecten kan hebben op hun carrière. Ondanks het belang werd er in voorgaand onderzoek weinig aandacht geschonken aan werkgerelateerd leren van pasafgestudeerden. Om die reden had dit doctoraat als doel het begrip van werkgerelateerd leren in de transitie naar werk te vergroten en te onderzoeken hoe persoonlijke factoren enerzijds en de fit tussen onderwijs en job anderzijds werkgerelateerd leren kunnen faciliteren.

In een eerste onderzoeksfase werden inzichten verworven op theoretisch niveau door middel van een systematische literatuurstudie (Studie 1). Deze studie had als doel een grondiger begrip te ontwikkelen over leren en onderwijs-job fit in de transitie naar werk, gebaseerd op 45 primaire studies. Wat leren betreft, focuste deze studie op de competenties die nodig zijn voor pasafgestudeerden. De resultaten geven aan dat vooral generieke competenties benadrukt worden. Meer specifiek worden theoretische kennis, communicatie, probleemoplossingsvaardigheden en leervaardigheden als meest belangrijk beschouwd. Ook de nood aan werkgerelateerd leren werd beklemtoond. Daarenboven werden de verschillende types fit alsook hoe vaak ze voorkomen bestudeerd in de transitie: Verticale, horizontale, competentie- en persoons-omgevingsfit werden benadrukt als belangrijke types fit voor afgestudeerden.

In de tweede onderzoeksfase werd er empirisch onderzocht hoe factoren in de transitie naar werk werkgerelateerd leren faciliteren. Als eerste stap werd er een instrument ontwikkeld en gevalideerd dat deelname aan werkgerelateerde leeractiviteiten meet (Studie 2). Het instrument werd opgebouwd op basis van een literatuuronderzoek en groepsdiscussies tussen domeinexperten; en werd onderzocht in een heterogene doelgroep van werknemers. Drie factoren werden van elkaar onderscheiden, namelijk formeel leren, informeel leren door gebruik van persoonlijke bronnen, informeel leren door gebruik van omgevingsbronnen. De resultaten toonden de betrouwbaarheid en validiteit van het instrument aan.

Om te onderzoeken hoe factoren werkgerelateerd leren beïnvloeden werd een kwantitatief longitudinaal onderzoek opgezet, waarin studenten op vijf momenten vragenlijsten invulden gedurende hun laatste jaar hoger onderwijs en hun eerste jaar op de arbeidsmarkt. De rol van de ontwikkeling van zelfeffectiviteit en prestatiedoelen (als persoonlijke factoren) voor werkgerelateerd leren werd onderzocht (Studie 3). De studie gebruikte een longitudinale en persoonsgecentreerde benadering door verschillen te onderzoeken in werkgerelateerd leren voor verschillende motivatieprofielen, gebaseerd op de gemeenschappelijke ontwikkeling van zelfeffectiviteit en prestatiedoelen. De resultaten toonden aan dat zelfeffectiviteit, leerdoeloriëntatie en prestatieoriëntatie gemiddeld stegen en dat vermijdingsoriëntatie daalde. Dit toont aan dat de transitie een verandering teweegbrengt en dat deze factoren getransfereerd worden naar een werkomgeving. Vier motivationele profielen werden geïdentificeerd, die verschilden in hun leergedrag: Het meeste leren na afstuderen werd gerapporteerd door afgestudeerden in het profiel dat gekenmerkt werd door hoge en stijgende zelfeffectiviteit, leerdoeloriëntatie en prestatieoriëntatie.

De laatste studie focuste op de relatie tussen onderwijs-job fit en werkgerelateerd leren (Studie 4). Theoretisch werden er twee (tegengestelde) processen voorgesteld voor deze relatie, waarin fit werkgerelateerd leren versterkt of vermindert. Deze studie testte deze hypotheses door fitprofielen te identificeren en te onderzoeken of er verschillen zijn in werkgerelateerd leren. Verschillen werden gevonden tussen de vier geïdentificeerde profielen, waarin afgestudeerden met een volledige fit het meeste leren na afstuderen aangaven. Bovendien bleven deze verschillen bestaan zes maanden later, wat aangeeft dat het fitprofiel een effect bleef hebben op werkgerelateerd leren.

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General Introduction



INTRODUCTION

Every year, approximately 42,500 graduates in Flanders finalise their higher education programme (Vlaams Ministerie van Onderwijs en Vorming, 2018). Whereas some of them will stay in higher education to obtain an additional degree, most will make the transition to the labour market. Hence, yearly a large number of new graduates enter this transition phase, which is widely accepted to be a critical period in their lives (Arnett, 2004; Koen, Klehe, & Van Vianen, 2012). Not only do recent graduates experience this moment of transition as a key event in their lives – changing from student status to being an employee – the transition from higher education to the labour market was found to have substantial effects on graduates' careers in the long term (Baert, Cockx, & Verhaest, 2013). These long-term effects, together with the large – and increasing (OECD, 2017) – number of graduates making the leap, has made it into a highly important topic of investigation.

When thinking about the transition to work, both in research and practice, the focus tends to be on the process of finding (qualitative) employment (Akkermans, Nykänen, & Vuori, 2015). However, the transition phase entails challenges beyond merely finding (future) employment (Le Maistre & Paré, 2004). Graduates will move forward from their familiar and stable higher education context to a new and mostly unknown working environment. They will need to adapt to their new job, including new tasks, relationships, and responsibilities (Le Maistre & Paré, 2004). These challenges require graduates to develop and update their knowledge base (Kuijpers & Meijers, 2002), which is crucial for graduates embarking on their careers (Brooks & Everett, 2008). In order to be *future-proof*, graduates will thus continuously have to learn in order to keep up with the demands of their job and to manage their (flexible) careers.

It is widely accepted that higher education should prepare its students for the transition to work (Teichler, 2007). This preparation includes providing the students with knowledge, skills, and attitudes that can be used to enter the labour market. However, preparing graduates to become and remain *future-proof* requires higher education to prepare them to be able to learn at work (Teichler, 2007). Despite its demonstrated importance, little is known about work-related learning in the beginning of the career and how factors within higher education can foster future employees' work-related learning. Accordingly, this dissertation aims to get a deeper understanding of work-related learning during the transition from higher education to work. The following sections will elaborate on both the meaning of work-related learning and the complexity of the transition to work.

WORK-RELATED LEARNING

Rapid technological advances and globalisation in current society emphasise the value of employees' ability to learn throughout the career (Hurtz & Williams, 2009). This work-related learning is defined as "the engagement in *formal* and *informal* learning activities, whereby employees and groups of employees acquire and/or improve competences (knowledge, skills and attitudes) that change individuals' present and future professional achievement and performance" (Kyndt & Baert, 2013, p. 275). This definition demonstrates that work-related learning is not a uniform and one-dimensional construct: Both formal and informal learning activities are important. Formal learning includes strictly organised learning activities, mostly in an educational setting, and can be structured in many ways, including predetermined objectives (e.g., trainings, workshops) (Colley, Hodkinson, & Malcolm, 2003). Informal learning activities are generally embedded in daily practice (Eraut, 2000). It emanates from engagement in and reflection on daily working activities (e.g., feedback-seeking, reflecting) and does not necessarily have to be actively encouraged by the employer (Eraut, 2000). To date most research has still solely concentrated on formal work-related learning, although research on informal learning has been steadily growing from the 1990s onwards and prior research demonstrated that formal and informal learning are equally important for employees' personal development (Slotte, Tynjälä, & Hytönen, 2004).

Both in research and practice, attention is paid to work-related learning mainly due to its benefits for both individuals and organisations (Kyndt & Baert, 2013). For organisations, employees' work-related learning can enhance their competitive position in the labour market (Gijbels, Raemdonck, & Vervecken, 2010), while individual employees benefit from work-related learning in terms of their professional development, making them more employable throughout their career. Although work-related learning is thus valuable for all employees, it has been argued that it is particularly important for young adults embarking on their careers due to the challenges involved in the transition process (Brooks & Everett, 2008). Moreover, benefits are larger for recent graduates: Investing in work-related learning from the start of graduates' careers pays off in the long term. It can result in a gain spiral, as participation in work-related learning results in an increase in personal resources that in their turn contribute to new participation in work-related learning activities (Hobfoll, Halbesleben, Neveu, & Westman, 2018; Kyndt, Endedijk, & Beauseart, 2018).

Given the demonstrated importance of participation in work-related learning, a crucial question that rises is how this can be facilitated. This issue was taken up in many studies investigating

antecedents of work-related learning. The systematic review of Kyndt and Baert (2013) provided an overview and categorisation of the different antecedents that were investigated over the last decades. As such, antecedents were identified at the *micro* level (personal and job characteristics), *meso* level (characteristics of the learning activity), and *macro* level (organisational and broader context; Kyndt & Baert, 2013). Although extensive attention has been paid to the assessment of antecedents of work-related learning, most of these studies did not take the specific career stage of employees into account, nor considered the role of higher education in preparing graduates for work-related learning. However, prior research did indicate that recent graduates tend to participate more in work-related learning than their more experienced colleagues (Brunello, 2004), demonstrating the importance of focusing on work-related learning in the transition to work. Given that graduates' initial transition to work and the start of their career involves specific characteristics, it is crucial to investigate whether previously identified antecedents can also foster work-related learning during the transition stage.

TRANSITION TO WORK

Every year, a large number of higher education graduates enters the world of work and this transition is demonstrated to have long-term career effects for graduates (e.g., Baert et al., 2013). Its relevance for this large number of graduates makes the transition from higher education to work into a well-researched theme (Teichler, 1999). However, this growing field of research remains scattered (Bonassi & Wolter, 2002). Various antecedents, behaviours, and outcomes that are investigated emphasise the multidimensionality of the transition but an overarching and well-grounded theoretical framework on the topic is still lacking (Bonassi & Wolter, 2002; Grosemans & Kyndt, 2017). Although different types of theoretical or heuristic research models can provide valuable insights for investigating the transition from education to work, none of them was specifically designed to examine what happens within education. This hampers their direct applicability in research on this topic.

Overall, three types of frameworks provide input for investigating the transition to work: the theory of emerging adulthood, career mobility models, and adjustment models. First, these models will be discussed separately. Afterwards, the models are compared in order to get more insight into their *common ground*. In order to fully grasp the complexity of the transition from education to work, their common ground is addressed in this dissertation.

THEORY OF EMERING ADULTHOOD

Theories taking a life span perspective generally focus on specific periods during individuals' life. As such, the *theory of emerging adulthood* is concentrated on the development of young adults (aged 18 to 25 years old; Arnett, 2000) and acknowledges that this period comes with specific challenges for young adults in their journey to adulthood. The existence of this life stage is widely accepted in industrialised countries, although its intensity can vary across young adults (Syed & Mitchell, 2013).

The theory of emerging adulthood describes the experiences of young adults in five characteristics that can be applied to *emerging adults.* These characteristics can provide valuable insights for understanding the transition to work (Grosemans, Hannes, Neyens, & Kyndt, 2018a). A first (and central) characteristic includes that emerging adulthood is a phase of *identity explorations*, in which individuals get to know themselves by exploring their options, both in love and work (Arnett, 2004). This characteristic is considered to be crucial, due to its intensity: Emerging adults can explore their identity, which enhances their personal development and can have long-term consequences. The second characteristic is related to the first and states that it is an *unstable* period, because of the wide range of choices that young adults are expected to make (Syed & Mitchell, 2013). As a third characteristic, Arnett (2000) mentions that it is a *self-focused* phase in which young adults take the time to focus on and explore their own needs. This is necessary to be able to engage in relationships in later stages of their lives. Fourth, emerging adulthood is the phase of feeling *in-between*. Young adults mostly feel that they are not adolescents anymore, but they do not consider themselves to be true adults either (Arnett, 2004). A last characteristic is that it is the phase of *possibilities* in which emerging adults' future is not fixed yet, creating additional possibilities to explore what they want before making enduring choices in their lives (Arnett, 2004; Syed & Mitchell, 2013). Relating these five characteristics to the transition to work, especially the first and the final characteristic are important: Recent graduates need to explore and construct their identity in a working context and they will experience possibilities leading to job explorations (Grosemans et al., 2018a).

CAREER MOBILITY MODELS

Career mobility is a central theme in the field of occupational and organisational psychology as well as within economic research. Career mobility includes that employees make transitions between jobs, which happens more frequently nowadays, given the uncertainty and unpredictability of careers (Forrier, Sels, & Stynen, 2009). In reply to the increasing amount of

job transitions, prior research aimed to grasp this mobility by including different relevant concepts into a model or framework (e.g., Sullivan & Arthur, 2006). In themselves, these career mobility models often do not seem to suffice to fully capture the complexity of the transition from education to work. While the latter inherently includes a change in context, some career mobility models focus on transitions *within* a certain organisation (Vardi, 1980). Moreover, most models start from voluntary and self-initiated transitions (Forrier et al., 2009; Pringle & Mallon, 2003), while transitioning from education to the labour market is an inevitable situation for young adults.

Within this category of career mobility models, the conceptual model of Forrier et al. (2009) seems to be most readily applicable to the education-work transition, because of its generic nature: The model focuses on work-role transitions in general and maps how factors can influence these transitions. A central process in this career mobility model is that transitions are dependent on both personal and contextual factors (Forrier et al., 2009). Career research used to focus predominantly on the individual, as the agent of one's own career. This agency perspective is still central in the model, operationalised as *movement capital* that includes employees' competences that influence their mobility opportunities. In addition to these personal factors, contextual factors are included in the model: Forrier et al. (2009) stress the *structure of risk and opportunities*, taking the demands of the labour market and the matching process between demand and supply into account. Besides the separate role of personal and contextual factors, they explicitly focus on the *interplay* between both. As such, the conceptual model for Forrier et al. (2009) acknowledges that contextual restrictions influence individuals' behaviour.

Next to the focus on factors at play during the transition, Forrier et al. (2009) stress the dynamic character of the model in calling it a 'dynamic chain'. This indicates that change is not viewed as a short-term event, but triggers change, as "a new work-role is the beginning of a new cycle" (Forrier et al., 2009, p. 752). For example, getting a new work-role directly influences one's movement capital, which can impact following transitions. Consequently, transitions are considered to be cyclical, in which previous experiences can influence subsequent choices (Forrier et al., 2009).

ADJUSTMENT MODEL BY NICHOLSON

A third model, the model of Nicholson (1990), takes a broad perspective on transitions. Nicholson (1990) and Nicholson and West (1988) consider every change in job content or employment to be a potential transition. The baseline idea of these models is that every

transition (i.e., every process of change) is characterised by a *need to adjust* to the new situation. Nicholson (1990) proposed a transition cycle describing what happens in transition processes in four phases: preparation, encounter, adjustment, and stabilisation. The *preparation* stage describes the phase taking place before the actual switch to a new context/experience, in which individuals are focused on preparing for the future and exploring their expectations and motives (Nicholson, 1990). In the *encounter* stage, being the first period in the new context, individuals encounter new experiences and emotions. After this first period in a new setting, the *adjustment* stage begins with assimilating to the context as core activity. The individual will be occupied with personal change and developing performance (Nicholson, 1990). A last stage includes *stabilisation* in the new context in which performance and effectiveness are the main goals (Nicholson, 1990). Although at first sight these stages seem to describe a linear sequence of events, Nicholson (1990) described his framework as a *cycle* with a strong focus on the process. Adjustment and stabilisation are reached based on the experiences in previous stages and every stabilisation is followed by a new preparation stage (Nicholson, 1990). The starting point of this process model is that the nature of the experience of people in transition will vary across contexts. Therefore, the framework is meant as a model that can be applied for every context and every person in transition (Nicholson, 1990).

DIFFERENT MODELS WITH A COMMON GROUND

While one could focus on the absence of a comprehensive model that fully grasps the factors that influence the transition from higher education to work, it may be more valuable to focus on the *common ground* of the existing models.

A central aspect that all models share refers to the overarching approach of the transition. They all state that the transition to work should be considered as a *process* rather than an event. Although prior research mostly focused on the period after graduation, these models all emphasise that the transition process already starts before the change of contexts. The theory of emerging adulthood states that emerging adults build on their prior experiences (Arnett, 2000). Both the career mobility model and the model of Nicholson emphasise the cyclical process of a transition, in which each transition is the foundation for a new transition (Forrier et al., 2009; Nicholson, 1990). Moreover, the model of Nicholson (1990) stresses the preparation stage as an important aspect of transitions. Hence, the models suggest that what comes before the actual transition, in this case the *period within higher education,* is a crucial part of the transition process of future graduates.

Besides approaching the transition as a process, it could be noted that the models acknowledge the complexity of the transition and emphasise the importance of *personal factors.* Within the theory of emerging adulthood identity formation is central, stressing personal development (Arnett, 2004). The career mobility model gives a prominent role to agency factors, endorsing the fact that individuals are the steer men of their own career (Forrier et al., 2009). Finally, the process model of Nicholson (1990) starts from individual experiences in acknowledging that the individuals themselves will need to guide the adjustment process. Accordingly, the three models have in common that they give a *central and active role to the person* in the transition. They consider the individual as the key actor throughout their own career.

A final crucial common aspect that can be derived from the models is that the transition to work is not an isolated process. The models all acknowledge that *context in which the transition takes place should not be ignored*. The theory of emerging adulthood states that graduates are in-between different stages, and that exploration (which is central) happens within a certain (work) environment (Arnett, 2004). Forrier et al. (2009) mainly point towards the (societal) context in identifying the demands of the labour market. Similarly, Nicholson (1990) argues that graduates go through the different stages because they have to adjust to a new context. Consequently, contextual factors (of the work environment) need to be considered when research wants to grasp the effect on outcomes in the transition to work.

Summarised, the models that are most frequently used to study transitions focus on a wide range of elements, in line with the multidimensionality of the transition to work (Teichler, 2007). However, they share how they consider the transition – as being a *process* that starts already during higher education. Moreover, the models share that the *individual* plays a central and active role in the transition process and that the *context* matters. Therefore, we will address these aspects in this dissertation by approaching the transition as a process and by taking personal factors and contextual factors into account when aiming to get more insight in how work-related learning can be facilitated.

OBJECTIVES OF THE DISSERTATION

This dissertation focuses on work-related learning in the transition from higher education to work. More specifically, it aims to get a *deeper understanding of work-related learning of recent graduates*, as work-related learning should play a central role in the beginning of their career (e.g., Brooks & Everett, 2008). Additionally, this dissertation aims to examine how graduates

can become future-proof by *investigating how personal and contextual factors within the transition from higher education to work facilitate this work-related learning*. In doing so, this dissertation takes the specificity of the transition into account, by approaching the transition as a process that starts within higher education. Furthermore, based on the different models on the transition to work, the dissertation assigns an active role to the individual and acknowledges the importance of contextual factors.

OBJECTIVE 1. INCREASE THE UNDERSTANDING OF THE NATURE OF WORK-RELATED LEARNING OF RECENT GRADUATES

Work-related learning is expected to play an important role for recent graduates: The entrance to a new work environment encompasses ample challenges, implying that work-related learning is crucial to keep up with the demands of their job (Brooks & Everett, 2008; Kuijpers & Meijers, 2002). Given the demonstrated (long-term) importance of work-related learning, it is essential to gain deeper understanding of the experiences of recent graduates with work-related learning in the first period in their job. Three aspects are considered to be important: the developed competences before the entrance to the labour market, the transfer of these competences to their job, and the role of learning at work.

Graduates have developed a set of knowledge, skills, and attitudes (i.e., competences), which they will use to perform in their new job (Evers & Rush, 1996). These competences are both an essential *starting point* and *outcome* of work-related learning. On the one hand, the developed competences can serve as a foundation to engage in future work-related learning (Kyndt et al., 2018). On the other hand, graduates will not have developed all necessary competences resulting in the need for work-related learning to further develop these competences (Heijke et al., 2003). Hence, in order to enhance our understanding of the role of work-related learning in the transition to work, it is necessary to get more insight in the knowledge, skills, and attitudes that are (or should be) developed by the end of higher education to perform optimally in graduates' first job.

Grasping the necessary competences should not be the only interest, as it is important to gain insight in how these competences can be used in their future job (i.e., as a starting point or an outcome). Therefore, it is crucial to explore how graduates transfer their competences to their new job, and consequently, how this is the basis of subsequent work-related learning (Abrandt Dahlgren, Hult, Dahlgren, Hård af Segerstad, & Johansson, 2006). Furthermore, more insight is needed in how graduates develop the competences that were not yet (sufficiently) developed within higher education by means of work-related learning.

A first objective is thus to increase understanding of the nature and role of work-related learning of recent graduates. As such, this dissertation sets out to explore the necessary competences before entering the workplace, how these competences are transferred to a working environment, and how graduates engage in learning at work.

OBJECTIVE 2. INVESTIGATE HOW FACTORS WITHIN THE TRANSITION TO WORK FACILITATE WORK-RELATED LEARNING

A next step to achieve the overarching aim entails to get more insight into factors that can foster work-related learning within the transition to work. Therefore, this dissertation focuses on both personal factors (i.e., objective 2a) and contextual factors (i.e., objective 2b).

Objective 2A. Grasp the influence of personal factors on work-related learning. A central defining aspect of the transition to work is that it is a process, starting within higher education and continuing until stabilisation in the job (Arnett, 2000; Forrier et al., 2009; Nicholson, 1990). This process-approach can also be found in the idea that higher education should prepare students for the transition to the labour market. This premise suggests that students (who become graduates afterwards) are able to transfer certain characteristics across contexts: It assumes that what is learned during higher education has effects on their behaviour after graduation. However, this assumption was rarely investigated and research that empirically investigated both the period in higher education and the first period at work at the same time is scarce (Teichler, 2007). Therefore, it is important to focus on this process-approach and to investigate whether factors within higher education can be transferred across contexts.

When focusing on the transfer of factors across contexts, it is particularly interesting to concentrate on *personal* factors. Whereas contextual factors are inherently tied to the educational or working context, personal factors are tied to the individual, having the potential to be transferred along with the individual from the educational context to the working context. Hobfoll et al. (2018) argue that individuals are able to acquire and conserve personal factors (as being resources) and use them for times of future need, stressing the importance of personal factors. Besides the potential of personal factors during the transition process, they are also demonstrated to be crucial antecedents of work-related learning (Kyndt & Baert, 2013). As such, the second objective considers the transition as a process and gives a central and active role to the individual by investigating the development of personal factors and its relation with work-related learning during the process of the transition to work.

Objective 2B. Examine the relationship between education-job fit and work-related learning. A sole focus on the individual does not suffice to fully capture and understand the transition process. Given that the transition is inherently characterised by a change in context, it is essential to take features of the context into account when studying the transition from education to work (e.g., Evers & Rush, 1996). When focusing on work-related learning, Kyndt and Baert (2013) demonstrated that job characteristics have an important influence on employees' learning. An essential job characteristic, especially in the case of early-career employees, encompasses the fit between employees' job and educational background – their education-job fit (Baert et al., 2013). The alignment of this first job and graduates' education appears to be very influential and prior research highlighted various effects of the fit between the educational background of graduates and their first job on graduates' job performance (Groot & Maassen van den Brink, 2000; McKee-Ryan & Harvey, 2011). Moreover, this education-job fit can have long-term effects on graduates' career (e.g., Baert et al., 2013).

Although education-job fit is described as a key job characteristic and an important antecedent of work-related learning, this relationship is mainly suggested theoretically and empirical evidence remains scarce (Brunello, 2004). Moreover, as described in literature, the nature of the relationship between education-job fit and work-related learning tends to be diffuse and ambiguous. Theoretically, two contradicting processes can be found regarding this relationship. Research starting from a human capital perspective argues that work-related learning *complements* an existing and appropriate set of competences (Brunello, 2004). Following this perspective, employees who are in a job that fits their educational background are expected to participate more in work-related learning activities. In contrast, other studies argue that work-related learning could *substitute* for prior education in case of a misfit, which implies that employees who are in a job that does not fit their background participate more in work-related learning (Heijke et al., 2003). Consequently, this dissertation takes the context into account – or more specifically the match in contexts – by investigating the relationship between education-job fit on the one hand and work-related learning on the other hand.

OVERVIEW OF THE DISSERTATION

In order to achieve the objectives of this dissertation, two research phases were conducted. In the first phase, we wanted to get insight in work-related learning in the transition to work on a theoretical level by exploring the literature, which could provide us with overarching insights in the objectives (i.e., Chapter 1). In the second phase, personal and contextual factors fostering

work-related learning were empirically investigated. First, we developed and validated an instrument measuring work-related learning in an integrative way with a broad applicability (i.e., Chapter 2). Afterwards, we investigated the role of (the development of) personal factors in work-related learning (i.e., Chapter 3) and the relationship between education-job fit and work-related learning (i.e., Chapter 4). The two research stages and corresponding studies will be outlined below. A schematic overview of the studies in this dissertation is presented in Figure 1.

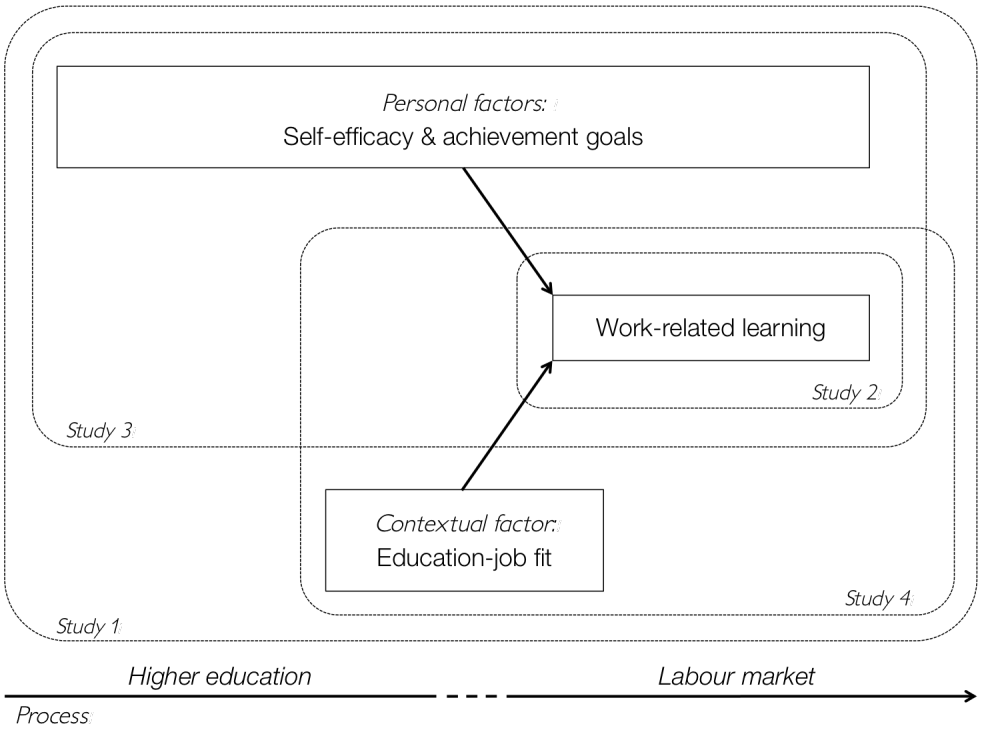


Figure 1. *Schematic Overview of the Dissertation.*

RESEARCH PHASE 1: STATE-OF-THE-ART ON THE TRANSITION TO WORK

First, we aimed to get a deeper insight in the transition to work on a theoretical level. In order to increase understanding on this topic, a systematic review study was conducted (i.e., Chapter 1).

Chapter 1. Exploring learning and fit in the transition from higher education to the labour market: a systematic review. As a first step towards gaining a deeper understanding of the transition to work, a systematic review study was conducted. The study aimed to gain more insight in learning and education-job fit during the transition to work. It is widely accepted that learning takes a central role within the transition to work. Therefore, the review focused on the knowledge, skills, and attitudes that are necessary for graduates when entering the world of

work. Furthermore, we wanted to investigate how the transfer of this knowledge, skills, and attitudes is experienced in the first period on the job. Finally, the role of learning at work was explored in the transition to work. Concerning education-job fit of graduates, the study aimed to provide an overview of the different types of fit described in literature that are important for recent graduates, including their incidence. Furthermore, the study aimed to identify background characteristics that can influence fit as well as consequences of fit.

To reach these goals, the literature was systematically searched and following databases were used: ERIC (OvidSP), Social Science Citation Index (SSCI), 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'. In addition, these terms were also combined with 'to' instead of 'transition', for example 'college to work'. These search terms led to 47,247 hits. After removing doubles, 20,454 unique references remained. Afterwards, several steps were taken in order to select the literature relevant to answer the research questions on (work-related) learning and education-job fit. The final database contained 45 primary studies, which were used to increase our understanding of work-related learning and education-job fit.

RESEARCH PHASE 2: EMPIRICALLY INVESTIGATING FACTORS INFLUENCING WORK-RELATED LEARNING

In the second research phase, we aimed to empirically investigate factors that influence work-related learning during the transition to work. Therefore, a longitudinal quantitative research design was used in which questionnaires were administered to students from various study disciplines. Different steps were taken to get more insight in how factors facilitate work-related learning of recent graduates. A first step included the development and validation of an instrument measuring work-related learning in an integrative way by focusing on both formal and informal learning activities (i.e., Chapter 2). Subsequently, we investigated the relationship between the development of personal factors and work-related learning (i.e., Chapter 3). Finally, the relation between education-job fit and work-related learning was examined (i.e., Chapter 4).

Description of the sample. In order to tackle the objectives and understand the transition from higher education to work as a process that stretches over time, a quantitative, longitudinal research design was used. Questionnaires were administered to students from various study disciplines of six institutions for higher education in Flanders, Belgium (one university and five university colleges) during the transition from higher education to work. More specifically,

students were invited to participate three times during their final year of higher education: the first time in November 2015 (at the start of their final year), the second time in February 2016 (at the start of the second semester), and in July 2016 (around the time of their graduation). Moreover, they were contacted again in November 2016 (approximately four months after graduation) and in May 2017 (approximately 10 months after graduation). A schematic overview can be found in Figure 2.

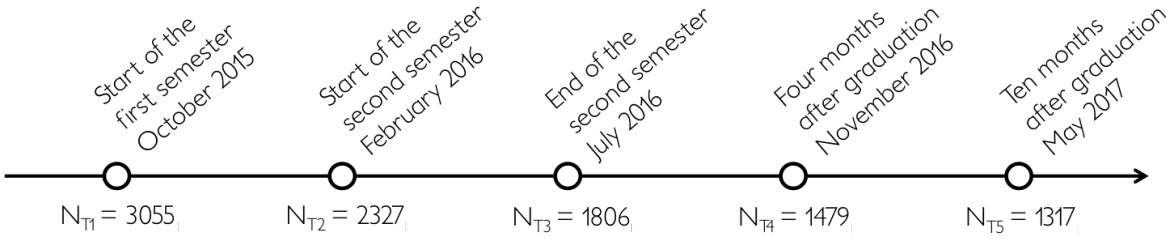


Figure 2. Overview of the Measurement Moments

At the first, second, and third wave of data collection, the educational institutions contacted their final-year students via email on their student account (as students had to check this on a regular basis) and invited them to participate. Furthermore, at the end of each questionnaire students were asked to add their (personal) contact details in order to contact them directly. Hence, the questionnaire was directly sent via email to students who provided contact information starting from the second wave onwards. All students were invited to participate each wave, even when they did not complete all previous waves of data collection. For each of the waves, the questionnaire was available for the period of one month, in which two reminders were sent to students who did not yet complete the questionnaire. Students were motivated to participate by raffling-off a gift voucher at the end of each wave.

In total, 4421 students participated at least once, 3922 of which completed all scales of at least one wave of data collection). In the first wave 3055 students entirely or partially completed the questionnaire (2724 completed the entire questionnaire), 2327 in the second wave (2137 complete), 1806 in the third wave (1528 complete), 1479 in the fourth wave (1408 complete), and 1317 graduates participated in the final wave (1189 complete). Of the 3922 participants who completed at least one questionnaire, 463 completed all five questionnaires, 444 completed four questionnaires, 542 completed three questionnaires, 796 completed four questionnaires, and 1677 completed only one questionnaire. These data are used in the

empirical studies in this dissertation. Table 1 presents the used measurement moments and the addressed objectives for each chapter.

Table 1. *Overview of Chapters, Objectives, and Measurement Moments*

	Chapter 1	Chapter 2	Chapter 3	Chapter 4
Obj. 1. Increase the understanding of the nature of work-related learning of recent graduates	✓			
Obj. 2. Investigate how factors within the transition to work facilitate work-related learning:		(✓)[a]		
Obj. 2a. Grasp the influence of personal factors on work-related learning	✓		✓	
Obj. 2b. Examine the relationship between education-job fit and work-related learning	✓			✓
Used measurement moments		4, 5[b]	1, 2, 3, 4	4, 5

Note. [a] Chapter 2 focused on the development and validation of an instrument, which was a necessary (methodological) step to investigate how factors facilitate work-related learning.

[b] Two additional data sets were combined with data of the fourth and fifth wave of data collection.

Chapter 2. Development and validation of a measurement of work-related learning. Research on work-related learning is often hindered by confusion on the topic. When investigating work-related learning, it can be noted that the concept is used interchangeably with learning antecedents, intentions, and outcomes (Taris & Kompier, 2005). Moreover, research tends to focus on formal learning activities, despite the importance of informal learning at the workplace (Hurtz & Williams, 2009). These two gaps are also reflected in how the concept is usually measured. Additionally, most instruments measuring work-related learning focus on one specific occupation (e.g., teachers; Kwakman, 2003). Due to the variety in the ways in which work-related learning is conceptualised and measured and due to the specificity of existing measures, it is difficult to compare different studies, which hampers advancement of the research field. Therefore, this second study contributed to the understanding of work-related learning in general by developing and validating an instrument measuring work-related learning that can be used to measure formal and informal learning activities simultaneously and that can be used across different occupations and throughout employees' career.

The instrument was developed based on a comprehensive review of the literature and several group discussions among the authors. After constructing the items, the instrument was tested in a large sample of Flemish employees. As we aimed to develop an instrument that could be widely used throughout employees' career, we combined the data of this research project with two other data sets (without a focus on recent graduates) in order to get a heterogeneous sample – resulting in a total sample size of 3232 employees. An exploratory factor analysis was conducted on one random subset of the data (n = 1616). The identified underlying structure was validated by means of a confirmatory factor analysis on the other random subset (n = 1616). The instrument was retested six months later to examine longitudinal measurement invariance and predictive validity (n = 1878).

Chapter 3. Work-related learning in the transition from higher education to work: The role of the development of self-efficacy and achievement goals. In line with the second objective of this dissertation, the third study aimed to investigate the role of the development of personal factors in work-related learning during the transition from higher education to work. By focusing on the development of these personal factors, this study empirically investigated whether personal factors can be transferred from the educational context to the working context.

Within the broad category of personal factors, self-efficacy and motivation have consistently been demonstrated to be strong predictors of work-related learning (Kyndt & Baert, 2013). Additional to their use for studying work-related learning, both self-efficacy and motivation were chosen as they have the potential to be important personal factors in the transition to work. They are both related to positive career outcomes (Akkermans et al., 2015; Bandura, 1997). In addition, self-efficacy and motivation have proven their value in both the educational and the workplace context (Kyndt, Donche, Gijbels, & Van Petegem, 2014; Nurmi, Salmela-Aro, & Koivisto, 2002). Self-efficacy refers to the "belief in one's own capabilities to organize and execute the courses of action required to produce given attainments" (Bandura, 1997, p. 3). In order to conceptualise motivation in the transition, the goal orientation framework of Elliot and McGregor (2001) is used. Elliot and McGregor (2001) make a distinction between different goal orientations, which are found to guide individuals' behaviour. Three goal orientations are frequently used in research: learning-goal orientation, performance-approach orientation, and performance-avoidance orientation. Students with a high *learning-goal orientation* are aiming to develop their competences. They are engaging in specific tasks in order to enhance their knowledge, skills, and attitudes (Elliot & McGregor, 2001). Students with a high *performance-approach orientation* are focused on demonstrating their competences and are often

comparing their competences with those of others (Elliot & McGregor, 2001). Lastly, students with a high *performance-avoidance orientation* are trying to avoid tasks for which they expect that the outcome will be negative.

First, the study took a process-approach to investigate the transition to work by examining the development of self-efficacy and achievement goals over the time span of one year. Second, the study took a closer look into the different patterns of development to detect motivational profiles, acknowledging individual differences between graduates. Finally, it was assessed whether graduates in different motivational profiles reported differences in work-related learning. Consequently, in this chapter, we took the development of personal factors into account and investigated how these factors are related to work-related learning. For this study, we analysed data of the graduates who obtained employment by the fourth wave of data collection (N = 814). For the development of self-efficacy and achievement goals, data of the first four waves of data collection of these graduates were analysed. In order to assess the development of the personal factors different multi-indicator latent growth curve models were estimated. Afterwards, a multidimensional latent class growth analysis was performed to identify latent profiles of participants with similar growth trajectories. Differences between these latent profiles in work-related learning were investigated by multivariate analyses of variance.

Chapter 4. The relationship between education-job fit and work-related learning: Capitalising on a head start or filling a gap? The fourth study contributed to the understanding of the alignment between higher education and work. The alignment of the first job and graduates' education appears to be of key influence for graduates. Most research investigating education-job fit focused on *vertical fit*, including the extent to which the obtained and required level of education are aligned (Verhaest, Sellami, & van der Velden, 2017). Although more recent studies also investigated the fit between the field of study and the job content, referred to as *horizontal fit* (Verhaest et al., 2017), research focusing on the interaction between vertical and horizontal fit has remained scarce. Therefore, this study aimed to provide a more nuanced view on the education-job fit of recent graduates by taking both vertical fit and horizontal fit into account. By concentrating on education-job fit, this study provided more insight in contextual factors (i.e., higher education and work) within the transition to work. Moreover, this study took individual differences into account by identifying education-job fit profiles. Subsequently, these profiles were related to work-related learning: Differences in work-related learning between graduates in different profiles were investigated. Finally, it was assessed whether these differences were sustained over time.

This study aimed to empirically assess the existing contradicting hypotheses on the relationship between education-job fit and work-related learning: Whereas the complementing hypothesis argues that graduates who's job is aligned with their educational background will learn more at work, the substituting hypothesis assumes that work-related learning is supposed to compensate in case of misalignment. Data were used of all graduates who indicated to be working at the fourth wave of data collection and who provided details on their fit situation (N = 779). We identified latent profiles of recent graduates. Afterwards, a three-step approach was used to detect differences in work-related learning between the different profiles. Finally, we estimated a latent change score model for graduates who remained in the same employment six months later (n = 398), assessing whether work-related learning remained stable over the next six months on the job. The sustainability of the effects was again assessed using the three-step approach.

Summarised, this dissertation aims to get a deeper understanding of work-related learning of recent graduates (i.e., objective 1) and to investigate how factors within the transition from higher education to work facilitate this work-related learning by focusing on both personal and contextual factors and by approaching the transition as a process, starting in higher education (i.e., objective 2). These objectives are addressed in the following chapters.

Chapter 1

EXPLORING LEARNING AND FIT IN THE TRANSITION FROM HIGHER EDUCATION TO THE LABOUR MARKET: A SYSTEMATIC REVIEW



This chapter is based on Grosemans, I., Coertjens, L., & Kyndt, E. (2017). Exploring learning and fit in the transition from higher education to the labour market: A systematic review. *Educational Research Review, 21,* 67-84. doi:10.1016/j.edurev.2017.03.001

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.

THEORETICAL BACKGROUND

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, & Omey, 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.

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 these are competences 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.

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 & Omey, 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).

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 1.1.

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?

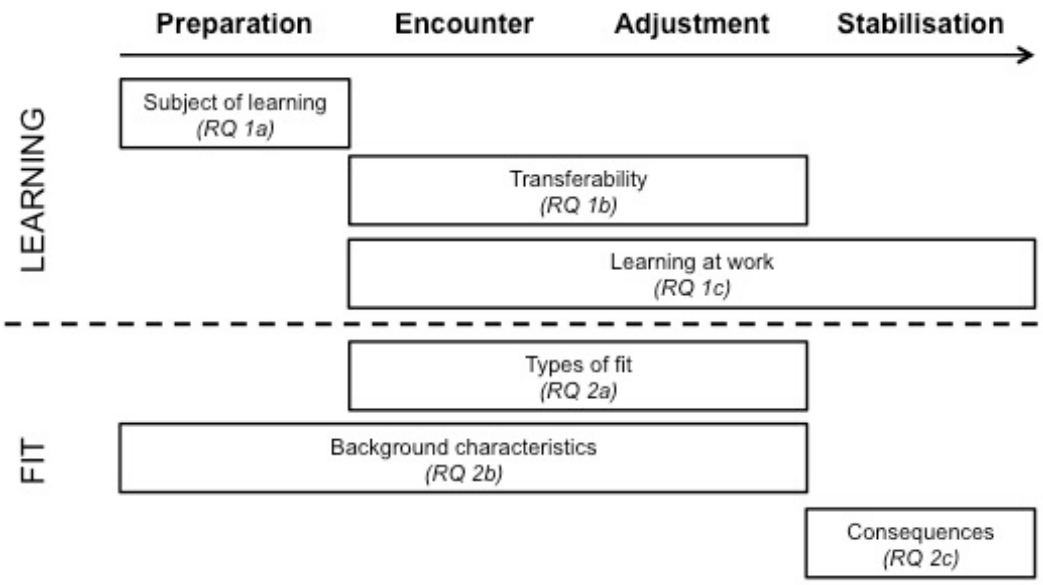


Figure 1.1 Schematic Overview of Research Topics

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 (RQ 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 (RQ 2b) and the consequences of fit that emerge when stabilised in the workplace (RQ 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?

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.

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 1.1.

Table 1.1. *Overview of Literature Search*

Search terms	ERIC (OvidSP)	SSCI	EconLit	FRANCIS
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**

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.

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.

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).

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 is 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.

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 1.2.

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; Zucchermaglio & 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 Stiwne & 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; Zucchermaglio & 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; Zucchermaglio & 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 Stiwne & 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 Stiwne

& 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 over 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 1.2. *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)
		Zucchermaglio & 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 Stiwne & 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)
Personal competences	Learning skills (*n* = 10)	Edgar et al. (2013)
		Edvardsson Stiwne & 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)
		Zucchermaglio & Alby (2009)
	Time management/Setting priorities (*n* = 6)	Edvardsson Stiwne & Jungert (2010)
		Evers & Rush (1996)
		Landrum, Hettich, & Wilner (2010)

	Nilsson (2010)
	Teichler (2007)
	Zucchermaglio & 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 1.2) 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).

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 1.3.

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 1.3. *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)	
Conceptual competences	Problem-solving (*n* = 1)		Nicolescu & Păun (2009)
	Decision making (*n* = 2)		Nicolescu & Păun (2009) Teichler (2007)
	Creativity/Innovation (*n* = 2)		Evers & Rush (1996) Nicolescu & Păun (2009)
Personal competences	Learning skills (*n* = 2)	Martin, Maytham, Case, & Fraser (2005)	Johansson, Kopciwicz, & Dahlgren (2008)
	Time management/Setting priorities (*n* = 1)		Teichler (2007)
	Critical thinking (*n* = 1)		Lindberg (2010)
	Managing stress/workload (*n* = 2)		Lindberg (2010) Teichler (2007)
	Working independently (*n* = 1)	Nicolescu & Păun (2009)	
	Adapting to change (*n* = 1)	Nicolescu & Păun (2009)	

People competences	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 Omey (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).

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.

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 Stiwne & 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 & Omey, 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).

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 trends, 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 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 & Omey, 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.

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 & Omey, 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.

Chapter 2

DEVELOPMENT AND VALIDATION OF A MEASUREMENT OF WORK-RELATED LEARNING



This chapter is based on Grosemans, I., Smet, K., Houben, E., De Cuyper, N., & Kyndt, E. (2018). *Development and validation of a measurement of work-related learning.* Manuscript submitted for publication.

Ilke Grosemans & Kelly Smet contributed equally to this article as first authors.

ABSTRACT

This paper describes the development and validation of an integrated instrument for measuring work-related learning, which can be applied in different occupational contexts. Based on a comprehensive literature review and group discussions among the authors, the instrument was carefully constructed and examined in a heterogeneous sample of Flemish employees (N = 3232). The data set was randomly divided into two subsets. An exploratory factor analysis was conducted on the first data set (n = 1616) to provide insight into the underlying structure of the instrument. The second subset of the data (n = 1616) was used to validate the retrieved structure by means of a confirmatory factor analysis and to investigate the internal consistencies, convergent and discriminant validity, and the measurement invariance across different groups. After six months, the instrument was retested among the same respondents to examine longitudinal measurement invariance and predictive validity. The results demonstrated that three factors could be distinguished and confirmed, namely informal learning activities using personal sources, informal learning activities using environmental sources, and formal learning activities. The results also provided solid evidence that the developed instrument is reliable and valid for measuring work-related learning.

Keywords: work-related learning; scale development; scale validation; formal learning; informal learning

INTRODUCTION

Most models in occupational health research traditionally focus on psychosocial stress and hazards. Yet, a few exceptions can be found within the field where the emphasis is also placed on the positive effects of work (Job Demands-Resources (JDR) model; Demerouti, Bakker, Nachreiner, & Schaufeli, 2001; Conservation of Resources (COR) model; Hobfoll, 1989; Job Demands-Control (JDC) model; Karasek, 1979). This paper focuses on one particular aspect, namely work-related learning, which has been – explicitly or not – recognised within these models (i.e., learning hypothesis in the JDC and JDR models) as an important asset in the emerging and complex work context (Demerouti et al., 2001; Hobfoll, 1989; Karasek, 1979).

Although the field of occupational health psychology is known by its thorough theoretical frameworks and in-depth knowledge of the work environment, their conceptualisation of learning remained perfunctory. More specifically, scholars almost never measure the learning behaviour directly, but instead use its term interchangeably for antecedents (e.g., motivation to learn, job challenge) or outcomes (e.g., job satisfaction, organisational/work commitment) of learning behaviour (Taris & Kompier, 2005).

To advance future research within this field, we suggest that insights from another strand of literature, namely educational sciences, may be beneficial to better understand learning in the context of work. However, while profound conceptualisations of learning have been developed in this strand of literature, research on work-related learning is rather fragmented. For example, a main distinction that exists in the literature differentiates formal (i.e., learning in a structured environment in terms of learning goals, support, and time) and informal learning (i.e., learning as an inherent part of work) as two distinct types of learning (Choi & Jacobs, 2011), and these have developed into separate literatures giving rise to two complications. First of all, by focusing on one type of learning, the full reality of work-related learning is not captured. Secondly, boundaries between formal and informal learning are ambiguous, and there are arguments to view work-related learning in a more integrated way: Different aspects of work-related learning in aggregate contribute to the development of individuals (Slotte, Tynjälä, & Hytönen, 2004).

The problem related to conceptual confusion is exacerbated in measurement issues: Most instruments focus on either formal or informal learning. In addition, most research on (informal) work-related learning uses qualitative methods and concentrates on specific occupational groups. While this has certainly added to the body of knowledge, a potential downside is that

this research is highly context-dependent, specific, and not applicable to other professions, and hence limiting possibilities for generalisation (Nikolova, Van Ruysseveldt, De Witte, & Syroit, 2014).

Based on those lacunae in the literature, the aim of the current study is to develop and validate a measurement instrument of work-related learning that captures a full range of learning behaviours employees engage in with regard to their (future) work (1), and that can be applied in a variety of contexts and occupations (2). A first step towards the development of this instrument entails defining work-related learning along an integrated approach. Subsequently, the existing instruments for measuring work-related learning are considered. Next, the development and empirical longitudinal testing of the integrated measurement of work-related learning are presented. Finally, strengths and limitations as well as opportunities for research and practice of the instrument are discussed.

LEARNING WITHIN THE FIELD OF OCCUPATIONAL HEALTH PSYCHOLOGY

The Job Demands-Control model (Karasek, 1979) concerns two distinct though related hypotheses: The idea is that specific combinations of demands and control relate to strain (strain hypothesis) or instead to active learning (active learning hypothesis). On the one hand, according to the first hypothesis, it is expected that jobs characterised by high job demands and low job control (i.e., high strain jobs) induce more mental strain such as depression and exhaustion while employees in low strain jobs (i.e., low job demands and high job control) will encounter least often depressions and exhaustion. On the other hand, according to the second hypothesis, workers employed in active jobs (i.e., high job demands and high job control) will participate most in learning compared with workers in passive jobs (i.e., low job demands and low job control) who will engage least in learning. Next to the strain and learning hypotheses, the model also tries to explain the effects of the work environment over time. Karasek and Theorell (1990) propose that jobs that are high in job demands and low in job control (i.e., high strain jobs) not only lead to residual strain in the short term, but also produce an accumulation of strain and anxiety in the longer term. These feelings would, in turn, inhibit learning because the employee withdraws from new learning challenges that arise in the workplace. This eventually will lead to more feelings of strain and less learning. Active jobs, on the other hand, promote learning in the short term and lead to feelings of mastery in the longer term. These feelings would, in turn, help the employee to manage ineluctable stress-inducing work

situations, leading to less feelings of strain and more learning (Karasek & Theorell, 1990; Van Ruysseveldt & Taverniers, 2010).

While the Job Demands-Control model (Karasek, 1979) started from only a limited number of work characteristics (i.e., work pressure and autonomy; Bakker & Demerouti, 2007), the Job Demands-Resources model assumes that, irrespective of the type of job involved, two general categories of work characteristics can be identified: job demands and job resources. Job demands refer to "those physical, psychological, social, or organisational aspects of the job that require sustained physical and/or psychological (cognitive and emotional) effort or skills and are therefore associated with certain physiological and/or psychological costs" (Bakker & Demerouti, 2007, p. 312) while job resources refer to "those physical, psychological, social, or organisational aspects of the job that are either/or: functional in achieving work goals; reduce job demands and the associated physiological and psychological costs; stimulate personal growth, learning, and development" (Bakker & Demerouti, 2007, p. 312). These two groups of work characteristics induce two largely independent psychological processes. In the first, health impairment process, high job demands deplete employees' mental and physical resources which leads to burnout and health problems (Schaufeli & Bakker, 2004). The second process assumes that job resources initiate a motivational process which leads to positive work outcomes such as work-related learning, work engagement, organisational commitment, and employee performance (Bakker & Demerouti, 2007).

Finally, also the Conservation of Resources theory has particular relevance to the field of occupational health psychology, where it has been widely applied to challenging work situations (Hobfoll, 2011). The basic idea of COR theory (Hobfoll, 1989) is that individuals aim to protect and foster their resources (i.e., objects, conditions, energies, or personal characteristics that are valued by the individual). Investing in resources prevents possible resource loss and helps to attain other resources. Engaging in work-related learning is considered to be an important resource-investment activity as it contributes to employees' performance, awareness and understanding, personal development, teamwork, knowledge and skills, decision making and problem-solving, and judgment (Eraut, 2004), which in turn are conducive to future personal growth and accomplishments (Zhang, Mayer, & Hwang, 2018).

Despite the theoretical importance of work-related learning within these models, little attention was paid to empirical research on, and the operationalisation of, work-related learning within the occupational health psychology field (Evers, van der Heijden, Kreijns, & Vermeulen, 2016; Parker, Jimmieson, & Amiot, 2017; Taris & Kompier, 2005). Relying on another research

stream, more specifically educational sciences, has the potential to yield new insights that may advance this particular field. In the following sections, we elaborate on the definition of work-related learning.

DEFINING WORK-RELATED LEARNING

Work-related learning is defined as the engagement in formal and informal learning activities whereby employees develop and/or improve competences that create a tenable change towards work-related goals (Kyndt & Baert, 2013). Three important aspects in this definition should be highlighted.

A first, and perhaps most critical, aspect in this definition is that work-related learning concerns the *engagement* in learning: The implication is that actual learning behaviour in the form of participation in learning activities is at the core of work-related learning (Raemdonck, Gijbels, & van Groen, 2014). This is in contrast to earlier studies that mostly use distant measures for learning (e.g., motivation, job challenge, job satisfaction, organisational/work commitment; Raemdonck et al., 2014; Taris & Kompier, 2005): Those aspects are drivers or outcomes of learning rather than actual engagement in learning (Wielenga-Meijer, Taris, Kompier, & Wigboldus, 2010). Taking the actual learning behaviour into account could help to address the conceptual confusion that was formulated perhaps most sharply by Taris and Kompier (2005) and the conceptual gap between what is measured and what should be measured (Raemdonck et al., 2014; Taris & Kompier, 2005).

A second aspect in the definition of work-related learning is the focus on developing and/or improving competences that create a *tenable change towards work-related goals*. In today's society, the vast majority of workers will, voluntary or not, perform different jobs and change organisations multiple times throughout their working life *(*DeFillippi & Arthur, 1994). As a result, their work-related goals will change repeatedly throughout one's career and employees will continuously need to update one's work-related knowledge and skills in order to successfully navigate on the (internal and external) labour market. Rather than arguing that work-related learning is inherently tied to a specific occupation, this definition emphasises that work-related learning can be undertaken for both one's current and future job.

A last aspect in the definition of work-related learning is the emphasis on *both formal and informal learning* activities which feature prominently in the literature of work-related learning (Streumer, 2006). Formal learning refers to learning activities that are structured in terms of

learning support, learning context, learning time, and learning objectives (Kyndt & Baert, 2013). More specifically, it is organised in an educational or training environment explicitly designed for learning (Jacobs & Park, 2009). In addition, it is planned within a prescribed learning framework with a fixed and limited time frame (Eraut, 2000). The desired learning objectives are predetermined, and the learning activity can lead to a certain certificate or diploma reflecting the learning objectives. Examples of formal learning activities are participation in formal programs, seminars, and workshops. Informal learning is often discussed in contrast to formal learning (Marsick & Watkins, 2001). Correspondingly, informal learning can be described as less restricted in terms of learning support, learning context, learning time, and learning objectives (Kyndt & Baert, 2013). Informal learning is embedded in daily work-related activities and is learner-initiated, without an intervention of an instructor (Livingstone, 1999; Noe, Tews, & Marand, 2013). Different types fall under the heading of informal work-related learning: interpersonal learning, intrapersonal learning and learning from non-interpersonal sources (Choi & Jacobs, 2011; Lohman & Woolf, 2001; Noe et al., 2013). Interpersonal learning relates to learning from and through social contact. Synonyms are social/collaborative/interactional learning, knowledge exchange, or learning from/with others (Choi & Jacobs, 2011; Lohman & Woolf, 2001; Noe et al., 2013). Examples are asking for feedback, discussing, and observing. Both intrapersonal learning and learning from non-interpersonal sources refer to learning without direct social interaction (Doornbos, Simons, & Denessen, 2008). Intrapersonal learning includes reflecting upon one's behaviour and exploring new ways of working. Synonyms are individual learning, experimentation, or learning from oneself (Choi & Jacobs, 2011; Lohman & Woolf, 2001; Noe et al., 2013). Learning from non-interpersonal sources, also known as environmental/external scanning, implies that one gathers professional knowledge and skills through scanning external sources, such as the Internet, books, and pictorial material (Lohman & Woolf, 2001).

Note that though the distinction between formal and informal learning is intuitively appealing, it has been criticised for being overly simple and not a good match with the complex reality of working life. More specifically, it can be argued that the boundaries between formal and informal learning are quite blurred (Choi & Jacobs, 2011), unlike the idea of distinct or even contrasting categories. Some researchers, for example, approach informal learning as inherently unintended (Baert, De Witte, Govaerts, & Sterck, 2011), while others assert that informal learning can also be intentional (Berg & Chyung, 2008; Marsick, 2003; Skule, 2004). In addition, informal learning can be spontaneous and unconscious, although Lohman (2006) states that it can also be planned and/or structured. Also Watkins and Marsick (1992) argue

that informal learning can be planned although they further note that it includes learning that is not designed or expected and not primarily directed at learning. Colley, Hodkinson, and Malcolm (2002) argue that in all or nearly all situations where learning takes place, elements of both formal and informal learning are present. But the most significant issue is not the boundaries between these types of learning, but the inter-relationships between dimensions of formality/informality, in particular situations (Colley et al., 2002). An example concerns talking about work with colleagues which could be more informal, for example when work issues are raised while chatting, or more formal, for example in mentoring situations (Colley et al., 2002). Put it differently, the extent to which learning is formal or informal is not really the point in question. The point instead is that we should approach work-related learning in a more integrated manner: focusing on the full range of learning activities, both formal and informal, one can undertake in relation to (future) work.

FEATURES OF EXISTING INSTRUMENTS ON LEARNING BEHAVIOUR

In the following, we elaborate on the existing measurements of employees' participation in learning activities. This further illustrates the dominant view of distinguishing between formal and informal learning.

Originally, instruments were focused upon formal learning, mostly because it is easier to measure (Hurtz & Williams, 2009): Participation in formal learning is dichotomous, with a predetermined beginning and ending, and HR metrics on number and hours of training are easily collected (Brown, 1989). Accordingly, measures are participation in formal trainings (e.g., in-company trainings, workshops, seminars) within a certain amount of time (participation during the past year, yes or no; Nelissen, Forrier, & Verbruggen, 2017) and training participation based on frequency (number of training events; Maurer & Tarulli, 1994; Pierce & Maurer, 2009; Tharenou & Conroy, 1994) and/or duration (hours spent in training; Chan & Auster, 2003; Froehlich, Beausaert, Segers, & Gerken, 2014; Tharenou & Conroy, 1994). During the past decade, more informal forms of learning came to the fore in research (Marsick & Watkins, 2001). Informal learning is more elusive and difficult to measure (Brown, 1989). As a result, most research is qualitative (Kyndt et al., 2016). The few quantitative measures that exist are context-specific (Nikolova et al., 2014): They focus on a specific occupation, such as police officers (Doornbos et al., 2008) or teachers (Kwakman, 2003), which hampers the generalisability and comparability across occupational settings. Some scholars try to approach

work-related learning in a more integrative way by incorporating formal learning into an informal learning measure (e.g., Berg & Chyung, 2008). Still, these measurements often reduce formal learning to participation in one specific activity (formal training), neglecting the variety that exists in formal learning.

In short, it can be stated that most measurements focus on formal learning (1) despite an enlarging research interest for informal learning (2). Hence, it can be concluded that work-related learning is mostly operationalised by using a fragmented approach rather than seeking for integration. Taking all this together, the aim of this study is to develop and validate an integrated instrument of work-related learning that is broadly applicable among different settings.

DEVELOPING THE INSTRUMENT

We developed the instrument through a series of five steps. To capture a wide range of learning activities, we started from existing measurements on work-related learning. We included measurements that were in line with the definition of work-related learning (Kyndt & Baert, 2013) and that took a broad variety of formal and/or informal learning activities (i.e., learning behaviour) into account. This resulted in the selection of six measurements (Berg & Chyung, 2008; Blau et al., 2008; Kwakman, 2003; Lauber, Taylor, Decker, & Knuth, 2010; Lohman, 2006; Noe et al., 2013) which formed the basis of the subsequent steps.

In the following step, the concrete learning activities in those measurements were inventoried. As the authors all obtained expertise within the topic of work-related learning, multiple group discussions were organised to categorise the learning activities. Many of these measures were occupation-specific and were therefore placed under broader categories (see the list below): The item “classroom observation” of Kwakman (2003), for example, was specifically constructed for teachers. As our goal was to develop a widely applicable instrument, this activity was placed under the category *observing others*. Three inventoried activities were not retained, due to their overlap with multiple other activities. In that case, the activity that was most encompassing was retained: *collaborating with others* was captured under learn by interacting with others and asking for information; *accessing journals and books* over the Internet or through libraries was captured by reading and searching for information; and *applying past experiences* was captured by reflection and experimenting. The procedure led to 11 general learning activities:

(1) searching for information;
(2) reading magazines, journals, books, etc.;
(3) experimenting;
(4) asking information;
(5) feedback-seeking;
(6) reflecting;
(7) observing others;
(8) interacting with others;
(9) attending conferences/seminars;
(10) attending training programs;
(11) attending workshops;

In the third step, it was inspected whether the list of 11 activities was exhaustive. After an in-depth discussion among the authors, the list of learning activities was extended from 11 to 15 learning activities. A first additional learning activity referred to *watching visual material* in order to include the digital information that is increasingly available: This learning activity complements the learning activity on reading written materials. A second activity related to *taking an e-learning course* was added based on similar arguments. Third, as a counterpart for the learning activity reflection, we added a learning activity referring to *thinking on beforehand* about how employees will manage things. Lastly, *attending presentations* was added, as a less active alternative to attending workshops. The list of learning activities was completed as follows:

(12) watching visual materials;
(13) thinking about how to manage (future) tasks;
(14) attending workshops;
(15) taking e-learning courses.

The fourth step in the development of the instrument entailed the construction and rewording of the items (Spector, 1992). Therefore, each learning activity was (re)formulated in a way in which all employees could understand them, regardless of their prior educational background (i.e., avoiding difficult words and adding examples) and regardless of their occupational position (i.e., avoiding occupation-specific words). Specific attention was given to the introduction to emphasise that the instrument focused on *work-related* learning activities. Therefore, the introduction stressed that only those activities that contributed to employees' learning and were related to their (future) work should be considered when rating the statements. Concerning the

selection of the scale, we opted for a scale measuring the frequency of participation, in line with prior measures of both formal and informal learning (e.g., Blau et al., 2008; Lauber et al. 2010). Learning activities are generally measured without using a predefined time span (e.g., Lohman, 2006), although specifying the time span limits own interpretations and avoids bias in scale development (Spector, 1992). Formal learning on occasion is measured in a time span of a year (e.g., Noe & Wilk, 1993). As informal learning activities are in nature embedded in daily work-activities (Noe et al., 2013), one could argue that the time span of one year is too extensive to measure informal learning behaviour. Consequently, a time span of six months was selected to make sure that participants had enough opportunities to learn during the proposed time span, and that they could still recall their participation in activities. A 7-point frequency scale was chosen, ranging from 1 "Never" to 7 "On a daily basis", which included an acceptable amount of time points to capture differences between respondents' participation (Miller, 1994).

The fifth and final step in developing the instrument, prior to the testing phase, concerned a pilot study with the aim to check whether the instrument in general was clear and easily understood. Twenty participants with varying educational backgrounds and occupational positions were selected. In this pilot study, participants were asked to complete the instrument, followed by an interview about their interpretations. More specifically, participants shared their interpretation of each item and were given the opportunity to provide suggestions for a better understanding of the instrument. Based on these interviews, the phrasing of the introduction and some items were further adapted. The instrument, including references to the original scales can be found in Appendix E.

TESTING THE INSTRUMENT

PROCEDURE

The instrument was tested in a first phase and retested among the same respondents in a second phase. In the first phase, we examined the underlying factor structure and measurement invariance across educational background and sector: We focused upon educational level in response to the observation and criticism that most studies focus on one specific level of education, mostly higher education (e.g., Kwakman, 2003). Therefore, measurement invariance was assessed for participants with, respectively, primary education (1), secondary education (2), or higher education (3) as their highest level of education. Similarly, prior research on work-related learning was commonly sector-specific (Kyndt & Beausaert, 2017), whereas this instrument is intended for use across sectors. Accordingly, we probed

measurement invariance across participants working in the profit and non-profit sector. Furthermore, the internal consistency was assessed as well as the convergent and discriminant validity.

In the second phase, the instrument was retested after six months among the same respondents. This phase was used to find additional support for the structure and to probe the reliability of the instrument. In addition, longitudinal measurement invariance was examined in order to make comparisons over time. Lastly, predictive validity was tested in relation with perceived employability. Perceived employability entails an individual's estimation of his/her chance of finding new employment elsewhere (De Cuyper & De Witte, 2011). The relation between work-related learning and perceived employability is suggested in prior research, both on theoretical and empirical grounds. Theoretically, human capital theory states that learning is key to feed an individual's employability (Berntson, Sverke, & Marklund, 2006). Similarly, within Conservation of Resources theory, it is stated work-related learning can function as an investment in resources, enhancing perceived employability (Lo Presti & Pluviano, 2015). Empirically, the relationship between work-related learning and perceived employability has been established (e.g., Berntson et al., 2006; Mallon & Walton, 2005).

SURVEY

The survey consisted of the work-related learning instrument containing 15 items. Furthermore, perceived employability was measured with the scale developed by De Cuyper and De Witte (2011). A sample item is "I could easily switch to another job elsewhere, if I wanted to". Finally, questions about background characteristics of the participants (i.e., gender, age, highest degree of education, years of work experience, sector, working hours, and type of contract) were also included (see Table 2.1).

Table 2.1. *Sample Characteristics*

	T1 (*N* = 3232)	T2 (*N* = 1878)
Gender		
Male	1292 (40.0%)	781 (41.6%)
Female	1875 (58.0%)	1085 (57.8%)
No information	65 (2.0%)	12 (0.6%)
Age		
Mean	37.54	37.77
Standard Deviation	12.97	13.19
Minimum - Maximum	18 - 67	20 - 66
Highest obtained degree in education		
Higher education	2077 (64.3%)	1210 (64.6%)
Secondary education	1032 (31.9%)	622 (33.1%)
Primary education	49 (1.5%)	30 (1.6%)
No information	74 (2.3%)	16 (0.9%)
Type of contract		
Permanent	2627 (81.3%)	1531 (81.5%)
Temporary	600 (16.3%)	343 (18.3%)
No information	5 (0.1%%)	4 (0.2%)
Working hours		
Full time	2471 (76.5%)	1443 (76.8%)
Part time	761 (23.5%)	435 (23.2%)
No information	0 (0.0%)	0 (0.0%)
Sector		
Profit	1024 (31.7%)	561 (29.9%)
Non-profit	2208 (68.3%)	1316 (70.0%)
No information	0 (0.0%)	1 (0.1%)
Work experience		
Mean	14.55	14.68
Standard Deviation	13.15	13.35
Minimum - Maximum	0 - 47	0 - 46

SAMPLE

The survey was distributed as part of different on-going research projects focusing on work-related learning in Flanders, Belgium. The instrument was included in three research projects in order to capture a variety of participants: a first project focused on the non-profit sector (1); a second project was directed towards recent graduates from higher education (2); and a final project added to the previous projects by taking multiple sectors and educational levels into account (3). Total sample included 3232 participants who were in paid employment at the time of data collection (T1). In order to retest the instrument, the survey was presented to all participants six months after their first participation (T2). In total, 1878 employees completed this survey (58.1% of the participants at the first wave of data collection). At both time points, most participants were female (58.0% and 57.8%). Furthermore, a large number of participants obtained a degree in higher education (respectively 64.3% and 64.6%). Most participants had a permanent contract (81.3% and 81.5%) and the non-profit sector was represented to a larger extent in the sample (68.3% and 70.0%) than the profit sector. Detailed characteristics of the sample both at T1 and T2 are presented in Table 2.1.

ANALYSES

In order to establish the structure of the instrument, the sample was randomly split in two equally large subsamples. The first subsample (n = 1616) was used to explore the structure of the instrument by means of an exploratory factor analysis (EFA; maximum likelihood) with an oblique rotation (direct oblimin). We used oblique rotation to account for the expected relationship between the different factors, much in line with the integrated approach of work-related learning (Reio & Shuck, 2015). The data of the second subsample (n = 1616) was used to confirm the structure identified with the exploratory factor analysis through confirmatory factor analysis (CFA). Afterwards, the second subsample was used to calculate the internal consistencies of the scales, followed by the assessment of the convergent and discriminant validity of the factors. Lastly, it was checked using subsample 2 whether the instrument was invariant across different groups.

In order to retest the instrument, the analyses started with a dropout analysis in view of identifying potential bias in the remaining sample at T2. Therefore, it was examined whether the scores on means on work-related learning at T1 differed significantly for employees who did and did not participate at T2. Afterwards, a CFA was conducted at T2 followed by the assessment of longitudinal measurement invariance. Subsequently, the test-retest reliability

was calculated to examine the stability of the instrument over time. Finally, the predictive validity of the instrument was tested.

The EFA was performed using SPSS (version 24). In order to assess longitudinal measurement invariance, Mplus (version 8.1.5) was used. All other analyses were performed in R (version 3.1.2), using the lavaan package (Rosseel, 2012), the Hmisc package (Harrell, 2016), and the psych package (Revelle, 2015).

RESULTS TESTING PHASE

Exploration of the structure. Firstly, it was checked whether the data were appropriate for conducting EFA. The sample size (n = 1616) was sufficiently high in relation to the number of parameters (Hair, Black, Babin, Anderson, & Tatham, 2009). Based on the determinant of the correlation matrix that equalled 0.001, it was concluded that the matrix did not contain extreme correlations. Furthermore, conducting an EFA was appropriate based on the Kaiser-Meyer-Olkin measure that equalled 0.90 and the Barlett's test of sphericity that was significant ($\chi^2(105) = 12114.73$; $p < .001$).

Secondly, the number of factors was determined based on the scree plot and the eigenvalues. Using the scree plot, factors before the first point of inflexion were retained. The eigenvalues of each factor needed to be larger than 1, and explained variance per factor needed to be sufficiently high (i.e., > 5% of the variance). The analysis resulted in a three-factor solution. Two items were omitted because of small loadings (<.45) on the factors (Q2 "tried something new (technique, method, behaviour, etc.)" and Q13 "took an e-learning course (online training)"). The first factor consisted of six items that refer to informal learning activities with regard to both inter- and intrapersonal resources and explained 39.35% of the variance. This factor will be labelled *informal learning activities using personal sources.* The second factor comprised three items that concern non-interpersonal informal learning activities and explained 8.57% of the variance and will be referred to as *informal learning activities using environmental sources.* The four items in the third factor explained 10.84% of the variance and refer to *formal learning activities*. The items and subsequent factor loadings can be found in Table 2.2.

Table 2.2. *Results Exploratory Factor Analysis*

Item code	Item	F1	F2	F3
Q7	Observed how others managed things.	.86	.06	.03
Q10	Asked the opinion of others on what I did.	.80	.09	.03
Q11	Talked about work experiences with others.	.79	.01	.01
Q6	Thought about how I handled things.	.71	-.09	-.04
Q12	Thought about how I would handle things on beforehand.	.70	-.07	-.04
Q3	Asked others for information.	.62	-.17	.08
Q14	Read magazines, websites, books, etc.	-.06	- .97	-.04
Q15	Watched visual material (documentary films, instruction videos, etc.).	.00	- .70	.09
Q1	Searched for information (websites, magazines, videos, books, etc.).	.14	- .63	.01
Q8	Took part in a workshop.	-.10	-.02	.81
Q4	Took part in a seminar/conference.	.04	-.03	.74
Q9	Attended a presentation.	.06	-.05	.69
Q5	Attended a training/ (additional) course.	.03	.05	.62

Note. Items were translated for publication purposes; the original and validated instrument was administered in Dutch.

Confirmation of the structure. The data were appropriate for conducting a CFA, as the sample size of the second subsample (n = 1616) exceeded the 10:1 ratio described by Hair et al. (2009). The CFA indicated that the model based on the identified three factors fitted the data in the second subsample ($\chi^2(62) = 712.01^{***}$; CFI = .94; TLI = .92; RMSEA = .08; SRMR = .05). The fit was considered acceptable despite the fact that the chi-square test showed significant results. It is known that this test is sensitive to a large sample size, which is the case here (Kyndt & Onghena, 2013). An overview of the final factor solution is presented in Table 2.3.

Subsequently, the internal consistency of the three factors was calculated based on the second subsample. The values of the standardised Cronbach's alpha were satisfactory for all three factors. Cronbach's alpha equalled .89 for the factor referring to informal learning activities

using personal sources; .83 for the second factor concerning informal learning activities using environmental sources; and finally .84 for the factor referring to formal learning activities.

Table 2.3. *Confirmatory Factor Analysis*

Item	Regression weight	Standard error	Standardised regression weight	Critical ratio[a]
Informal learning activities using personal sources				
Q7	1.00	[b]	.82	[b]
Q10	0.93	.03	.76	32.95
Q11	0.95	.03	.79	34.88
Q6	0.96	.03	.75	32.48
Q12	0.91	.03	.70	29.89
Q3	0.86	.03	.71	30.19
Informal learning activities using environmental sources				
Q14	1.00	[b]	.87	[b]
Q15	0.85	.03	.79	32.58
Q1	0.78	.03	.71	29.17
Formal learning activities				
Q8	1.00	[b]	.81	[b]
Q4	1.01	.03	.77	30.81
Q9	1.04	.03	.77	30.93
Q5	0.89	.04	.65	25.45

Note. Estimation method: maximum likelihood

[a] All critical ratios: $p < .001$

[b] Value fixed at 1.00 for model identification purpose, hence no standard error was computed

Convergent and discriminant validity. In order to assess convergent and discriminant validity, the criteria of Fornell and Larcker (1981) were used. Fornell and Larcker (1981) stated that in order to establish *convergent validity,* the average variance extracted (AVE) should be sufficiently high. The squared multiple correlations (R^2) of the items for the informal learning

activities using personal sources ranged from .49 to .66 with an AVE of .56, indicating that 56% of the variance in the factor on informal learning activities using personal sources was explained by the six items. For the informal learning activities using environmental sources, the squared multiple correlation ranged from .50 to .76. The AVE equalled .63, indicating that 63% of the variance was explained by the three items. The range of squared multiple correlations of the formal learning activities factor varied between .42 and .65. In this last factor, 56% of the variance was accounted for by the four items. The AVE of each factor was shown to be sufficiently high, as values higher than .50 can be considered acceptable (Fornell & Larcker, 1981; Hair et al., 2009). Therefore, it can be concluded that the evidence for convergent validity was satisfactory.

Following the criteria of Fornell and Larcker (1981) discriminant validity is satisfactory when the AVE of each factor is larger than the variance it shares with another factor. In order to assess this, the square root of the AVE was calculated and this square root should exceed the value of the correlation with other factors. The square root of the AVE per factor is displayed on the diagonal in Table 2.4. As shown, the square root AVE was larger than the correlations with the other factors of work-related learning, providing evidence for discriminant validity.

Table 2.4. *Correlation Matrix Work-Related Learning*

	1.	2.	3.
1. Informal learning activities using personal sources	.75		
2. Informal learning activities using environmental sources	.48***	.79	
3. Formal learning activities	.38***	.41***	.75

Note. Diagonal: Square root average explained variance

*** $p < .001$

Measurement invariance. The stability of the model across groups was assessed by checking the measurement invariance of the instrument, which determines whether the items and constructs are interpreted similarly by different groups of participants. Different levels of measurement invariance are considered, as described by Kyndt and Onghena (2013). The first level, *configural invariance*, indicates whether the structure of the instrument is invariant across groups. In the second level, *metric invariance*, it is tested whether different groups interpret the items in the same way. Finally, the third level of invariance, *scalar invariance*, assesses whether differences in means of the items can be ascribed to differences in the means of the

constructs. It can be stated that measurement invariance is achieved if the fit of the constrained model (i.e., model with higher level of invariance) is not significantly worse than the less restricted model (i.e., model with lower level of invariance). In this study, the model was considered as worse than the previous model if the difference between the CFI values of both models exceeded .01. The difference in the chi-square test was not considered when making the decision, as this is highly sensitive to sample size (Iacobucci, 2009). In the present study, measurement invariance was tested on the second subsample for participants with different educational backgrounds and for participants in the profit and non-profit sector.

Educational background. The results showed that configural invariance was achieved (see Table 2.5), indicating that the structure of the instrument was invariant across participants whose highest obtained degree was primary, secondary education, or higher education. Furthermore, metric invariance was achieved, which indicated that the items were interpreted in a similar way. Finally, the achievement of scalar invariance implies that differences in means of observed items were reflecting differences in means of the latent construct, indicating that the instrument is appropriate for making comparisons between groups of participants with different educational backgrounds.

Sector. Configural, metric, and scalar invariance was achieved (see Table 2.5), indicating that the instrument is invariant across respondents working in the profit and respondents working in the non-profit sector.

Table 2.5. *Measurement Invariance across Groups*

Groups	Model					Model comparison			
		χ^2 (*df*)	CFI	RMSEA	BIC		$\Delta\chi^2$ (Δdf)	*p*	ΔCFI
Educational background	Model 1 (configural invariance)	791.10 (186)	.936	.079	65255				
	Model 2 (equal loadings)	860.97(206)	.931	.078	65178	Model 1 vs. Model 2 (metric invariance)	69.86 (20)	< .001	.005
	Model 3 (+ equal intercepts)	936.16 (226)	.925	.077	65106	Model 2 vs. Model 3 (scalar invariance)	75.20 (20)	< .001	.006
Sector	Model 1 (configural invariance)	766.52 (124)	.938	.080	67141				
	Model 2 (equal loadings)	783.00 (134)	.938	.077	67084	Model 1 vs. Model 2 (metric invariance)	16.49 (10)	.09	.001
	Model 3 (+ equal intercepts)	860.32 (144)	.931	.078	67087	Model 2 vs. Model 3 (scalar invariance)	77.32(10)	< .001	.006

RESULTS RETESTING PHASE

Dropout analysis. For each of the three factors, we checked whether the means of employees who participated at T2 differed significantly from the means of employees who did not participate at T2. The results of the independent sample t-test showed that no significant differences were found between the two groups concerning their participation in formal learning activities ($t(2842.12) = -0.185$; $p = .85$), informal learning activities using personal sources ($t(2862.86) = -1.75$; $p = .08$), nor informal learning activities using environmental sources ($t(2902.51) = -1.11$; $p = .27$).

Confirmation of the structure. In the retesting phase, the structure of the instrument was confirmed: The CFA showed an acceptable fit with the data ($\chi^2(62) = 1011.19$***; CFI = .92; TLI = .90; RMSEA = .09; SRMR = .05). These results can be found in Table 2.6.

The internal consistency proved to be sufficient, as the Cronbach's alpha of the factor with informal learning activities using personal sources equalled .89. For the factor informal learning activities using environmental sources, Cronbach's alpha was .81. Finally, Cronbach's alpha equalled .83 for the factor with formal learning activities.

Measurement invariance over time. In contrast to testing measurement invariance across groups, longitudinal measurement invariance was performed for each factor separately (Coertjens, Donche, De Maeyer, Vanthournout, & Van Petegem, 2012). The results are presented in Table 2.7. For each factor, the results showed configural, metric, and scalar invariance over time. This demonstrates that the structure and items of the instrument are understood similarly over time and that changes in the items over time can be attributed to changes in the latent constructs.

Test-retest reliability. Significant correlations were found between T1 and T2 for informal learning activities using personal sources ($r = .72$; $p < .001$), informal learning activities using environmental sources ($r = .60$; $p < .001$), and formal learning activities ($r = .56$; $p < .001$), providing support for the reliability of the instrument over time.

Predictive validity. The predictive validity of the three factors was assessed in relationship with perceived employability. First, the structure of the scale of perceived employability was tested. The results of the CFA showed a very good fit with the data ($\chi^2(2) = 4.00$; CFI = 1.00; TLI = 1.00; RMSEA = .02; SRMR < .001). To test the predictive validity, the correlation of the factors at T1 with perceived employability at T2 was investigated. The correlations equalled .18

($p < .001$) for the informal learning activities using personal sources, .12 ($p < .001$) for the informal learning activities using environmental sources, and .14 ($p < .001$) for the formal learning activities. These moderate but significant correlations demonstrate the predictive character of work-related learning for perceived employability.

Table 2.6. *Confirmatory Factor Analysis of the Second Measurement Moment*

Item	Regression weight	Standard error	Standardised regression weight	Critical ratio[a]
Informal learning activities using personal sources				
Q7	1.00	[b]	.82	[b]
Q10	0.92	.03	.76	35.85
Q11	0.95	.03	.79	37.80
Q6	0.96	.03	.75	35.33
Q12	0.88	.03	.70	32.29
Q3	0.84	.03	.69	31.91
Informal learning activities using environmental sources				
Q14	1.00	[b]	.86	[b]
Q15	0.81	.03	.77	31.97
Q1	0.78	.03	.69	29.27
Formal learning activities				
Q8	1.00	[b]	.79	[b]
Q4	1.00	.03	.74	30.27
Q9	1.12	.04	.78	31.65
Q5	0.91	.04	.64	26.38

Note. Estimation method: maximum likelihood

[a] All critical ratios: $p < .001$

[b] Value fixed at 1.00 for model identification purpose, hence no standard error was computed

Table 2.7. *Longitudinal Measurement Invariance*

Scale	Model					Model comparison			
		χ^2 (*df*)	CFI	RMSEA	BIC		$\Delta\chi^2$ (Δdf)	*p*	ΔCFI
Informal learning activities using personal sources	Model 1	558.53 (47)	.963	.076	72076.24				
	Model 2 (equal loadings)	559.92 (52)	.963	.072	72039.95	Model 1 vs. Model 2	1.39 (5)	.93	.000
	Model 3 (+ equal intercepts)	575.22 (57)	.963	.070	72017.55	Model 2 vs. Model 3	15.30 (5)	.009	.000
Informal learning activities using environmental sources	Model 1	22.77 (5)	.997	.044	39552.72				
	Model 2 (equal loadings)	23.18 (7)	.997	.035	39538.05	Model 1 vs. Model 2	0.41 (2)	.81	.000
	Model 3 (+ equal intercepts)	29.53 (9)	.996	.035	39529.32	Model 2 vs. Model 3	6.35 (2)	.04	.001
Formal learning activities	Model 1	207.99 (15)	.970	.083	39930.47				
	Model 2 (equal loadings)	209.79 (18)	.970	.075	39909.66	Model 1 vs. Model 2	1.80	.61	.000
	Model 3 (+ equal intercepts)	211.33 (21)	.971	.069	39761.22	Model 2 vs. Model 3	1.54	.67	- .001

DISCUSSION

Work-related learning takes a prominent role within multiple theoretical frameworks within the field of occupational health psychology. Despite its importance, little occupational health research explicitly investigates work-related learning and moreover different operationalisations are used leading to conceptual confusion (Taris & Kompier, 2005). Furthermore, existing measures are quite specific in terms of focus upon formal or informal work-related learning and in terms of context. In response, the aim of the current study was to develop and validate an integrated measure of work-related learning that is widely applicable. In order to achieve this goal, an inventory was made of learning activities included in existing instruments to measure (certain aspects of) work-related learning. Based on a pilot study, the instrument was adapted for use in the testing phase. In the following phase, tests involved exploratory and confirmatory factor analyses to provide insight in the dimensionality of the instrument. Six months later, the instrument was retested to confirm the structure of the instrument and to check the validity over time. Applicability was tested in relation to context (here: sector) and individual background (here: educational level). In conclusion, the instrument consisted of 13 items and was demonstrated to be a reliable and valid instrument to measure participation in work-related learning. In the following sections, the contributions will be further discussed.

A first contribution is that the instrument enhances conceptual clarity. Taris and Kompier (2005) demonstrated the conceptual confusion of work-related learning in the case of the Job Demands-Control model. This study used specific literature on work-related learning to avoid conceptual confusion. Hence, it focuses on actual learning behaviours as a proximal measure of learning (Raemdonck et al., 2014), much in line with the definition by Kyndt and Baert (2013). Consequently, the instrument has the potential to contribute to existing theoretical frameworks using work-related learning (i.e., Job Demands-Resources model, Job Demands-Control model, and Conservation of Resources model). By focusing on learning behaviour, it is possible to get more insight in how different antecedents lead to work-related learning and what its outcomes are, in line with the proposed frameworks.

Another contribution is that our instrument integrates a wide range of learning activities while capturing the different dimensions at the same time. This contrasts with the tradition of focusing on either formal or informal learning activities. By measuring all learning activities simultaneously three factors were found in the analyses. A first factor clustered all activities that are traditionally more organised and structured, such as workshops and conferences. These

activities have a *formal* nature. The other two factors clustered informal activities, which do not have a preset structure and are not part of a curriculum, such as observing others or talking about work experiences (Eraut, 2000). The aspect that distinguishes those factors lies in the *source* used in the learning activity. One factor included learning activities that have an *intrapersonal character* (e.g., reflection and looking ahead), as well as activities with an *interpersonal character* (e.g., asking feedback, asking for information). As such, this factor clustered informal learning activities that arise from the use of personal sources (both interpersonal and intrapersonal). The other factor of informal learning activities encompassed three activities which share the characteristic to use *non-interpersonal or environmental sources* (i.e., reading, searching for information, watching videos). These results demonstrate that the source of the learning activity does matter and that a distinction can be made between learning activities using environmental sources (such as books, videos, internet) and personal sources (both intra- and interpersonal). In conclusion, it can be stated that a wide range of learning activities is included in the instrument, demonstrating the multidimensionality of work-related learning. While prior research mainly focused on one specific aspect (e.g., either formal or informal learning activities; Hurtz & Williams, 2009), this instrument takes the existing categorisations and measurements of work-related learning one step further by making it possible to measure all activities simultaneously in one instrument.

In addition to including a wide range of learning activities, this measurement contributed to research on work-related learning in being *applicable* to all employees, with varying educational backgrounds working in different sectors. Most measurements of work-related learning to date are highly context-specific (e.g., teachers, managers; e.g., Kwakman, 2003, Noe et al., 2013). Taking a career development perspective in mind, this specificity might be problematic: When instruments are tied to one specific context, job mobility is neglected. As work-related learning is not tied to one specific job, context-specific measures limit the possibility of taking a longitudinal perspective and hinder comparison of results across settings, for which there is a growing need (Kyndt & Beausaert, 2017). In order to make these comparisons, it is particularly important to have one instrument that can be used among different individuals working in different contexts. In response, this study demonstrated that the instrument we developed is widely applicable and not tied to these specific contextual factors. As such, the instrument adds to theory-development, as the wide applicability could enhance further advancements in theoretical models of work-related learning. The applicability also contributes to practice, as the instrument is suitable to map the learning behaviours of *all* employees, which allows organisations to get a better understanding of work-related learning in general.

Despite the value of the developed instrument, the current study comes with certain limitations. A first limitation is that the instrument is validated in a sample of Flemish employees. The validation of the instrument in other languages and labour markets is an important aim for future research. Along similar lines, the instrument was only validated among employees. However, as work-related learning might also relate to future employment, the instrument was developed in such a manner that it could also apply for the unemployed, self-employed, and students. The validation of the instrument among these groups serves as another route for future research.

Another limitation is that the heterogeneity of the sample, which was necessary for a thorough validation of the instrument, did allow for a comparison on the level of sectors but not on the level of occupations. A suggestion for future research is to get a more fine-grained insight in the possibilities to make comparisons across occupations.

A final limitation is that the instrument relies on self-reports. By collecting data in a heterogeneous and large sample, we aimed to limit sample-specific bias. However, to get a complete understanding of the participation in learning activities, it would be interesting for future research to triangulate the data and complement the self-report data with data of other stakeholders, such as colleagues or supervisors (Simmering, Colquitt, Noe, & Porter, 2003).

In conclusion, we developed and validated an instrument measuring work-related learning with specific attention towards the integrated nature of work-related learning and generalisability across educational backgrounds and occupational sectors. This instrument sheds light on the multidimensional structure of work-related learning which contributes to research and practice in improving understanding of its complex nature.

Chapter 3

WORK-RELATED LEARNING IN THE TRANSITION FROM HIGHER EDUCATION TO WORK: THE ROLE OF THE DEVELOPMENT OF SELF-EFFICACY AND ACHIEVEMENT GOALS



This chapter is based on Grosemans, I., Coertjens, L., & Kyndt, E. (in press). Work-related learning in the transition from higher education to work: The role of the development of self-efficacy and achievement goals. *British Journal of Educational Psychology.*

ABSTRACT

Background. Work-related learning is particularly important at the start of graduates' careers. Preparing students for work-related learning is a chief aim of higher education, demonstrating its relevance when investigating the transition to work.

Aim. This study aimed to investigate the role of personal factors for work-related learning during the transition from higher education to work. This study took a longitudinal and person-centered approach by examining differences in work-related learning between different motivational profiles based on the conjoint development of self-efficacy and achievement goals.

Sample. Questionnaires were administered four times, starting in the beginning of students' final year of higher education until four months after graduation (N = 814).

Methods. In order to assess the development of the personal factors different multi-indicator latent growth curve models were estimated. Afterwards, a multidimensional latent class growth analysis was used to identify latent profiles of participants with similar growth trajectories. Differences in work-related learning were investigated by a multivariate analyses of variance.

Results and Conclusions. The results revealed an average increase in self-efficacy, learning-goal, and performance-approach orientation, indicating that the transition to work triggers change in these personal factors. Performance-avoidance orientation decreased on average. Four distinct motivational profiles were discerned: strongly efficacious and approach-oriented, moderate efficacious and approach-oriented, moderate efficacious and learning-oriented, and undecided profile. Furthermore, differences were found concerning work-related learning, in which the strongly efficacious and approach-oriented profile reported more participation in formal and informal learning activities using personal sources; while the undecided profile showed least participation in the latter.

Keywords: transition to work, early-career employees, work-related learning, self-efficacy, achievement goals

INTRODUCTION

The transition from higher education to work is an important period in the life of young adults (Koen, Klehe, & Van Vianen, 2012). Their entrance into a new context brings its own challenges (Le Maistre & Paré, 2004). Consequently, early-career employees are expected to develop new competences and deepen their current competences (Abrandt Dahlgren, Hult, Dahlgren, Hård af Segerstad, & Johansson, 2006). This can be achieved through work-related learning, being employees' engagement in learning activities that leads to the improvement of their competences (Kyndt & Baert, 2013). As work-related learning is especially important for early-career employees (Brooks & Everett, 2008), the present study investigates work-related learning during the challenging period of the transition from education to work.

While many challenges in this transition are clearly situated in the period after graduation (e.g., finding employment, adapting to the new context), students are already preparing themselves for the transition to work during their years in higher education (Grosemans, Coertjens, & Kyndt, 2017; Koen et al., 2012; Nicholson, 1990). Analogously, preparing students for work-related learning is a main aim for higher education (e.g., Endedijk & Vermunt, 2013). Therefore, and in contrast to the majority of the existing studies on the transition from higher education to work, the current study approaches this transition as a dynamic period, spanning the period of higher education, the actual finding of a job, and the adjustment to this new environment (Grosemans et al., 2017). More concretely, this study aims to get more insight in the transition to work by taking a dynamic approach and investigating how the development of personal factors within higher education contributes to work-related learning of early-career employees.

THEORETICAL BACKGROUND

PERSONAL FACTORS AND WORK-RELATED LEARNING

Work-related learning is defined by Kyndt and Baert (2013) as "the engagement in formal and informal learning activities both on and off the job, whereby employees and groups of employees acquire and/or improve competences that change individuals' present and future professional achievement and organisational performance" (p. 275). This definition approaches work-related learning in an integrative way, emphasising both formal and informal learning activities. *Formal learning activities* are those activities that are more strictly organised, often within a fixed and limited time span, such as trainings (Eraut, 2000). *Informal learning activities* are typically activities that follow from working (Lohman, 2006). These activities are generally

less restricted concerning learning time or objectives, such as discussing with colleagues or reflection (Noe & Wilk, 1993). Work-related learning is demonstrated to be particularly important for graduates embarking on their career, as the entrance to their new job comes along with many challenges that can trigger work-related learning (Brooks & Everett, 2008). While work-related learning of employees is a commonly investigated topic, little is known about work-related learning in the case of early-career employees (Hurtz & Williams, 2009). More specifically, Kyndt and Baert (2013) identified numerous antecedents of work-related learning in general, but the question remains as to how factors in higher education can prepare students for future work-related learning.

When focusing on antecedents of work-related learning within the transition from higher education to work, *personal factors* are particularly interesting. These factors can be transferred across contexts, which is in contrast to those inherently tied to contexts of either school or work. Self-efficacy and achievement goals are demonstrated to be important personal factors for work-related learning: They are both related to how individuals regard, evaluate, and define their competence and these perceptions have been found to predict both performance and the capacity of learning new competences (Bandura, 1997; Noe & Wilk, 1993; Pajares, 1996; van Dinther, Dochy, & Segers, 2011).

Starting from the premise that personal factors can be transferred across contexts, it is important to note that self-efficacy and achievement goals are considered to be changing states (Fryer & Elliot, 2007). Change can be triggered in these states when individuals need to regulate their goals, which is apparent in transition processes due to the entrance to a new environment (Haase, Heckhausen, & Köller, 2008). Although prior research devoted limited attention to the development of these personal factors in the context of the transition to work, the development of both self-efficacy and achievement goals in other transition processes was demonstrated (Anderman & Midgley, 2004; Friedel, Cortina, Turner, & Midgley, 2010). Combining the fact that change in those personal factors is expected under these changing circumstances and the importance of these personal factors for work-related learning, it is crucial to consider the development of self-efficacy and achievement goals during higher education when investigating these personal factors as predictors of work-related learning of early-career employees.

ACHIEVEMENT GOALS IN THE TRANSITION TO WORK

The goal orientation framework of Elliot and McGregor (2001) is particulary relevant to the transition from education to work: Nurmi, Salmela-Aro, and Koivisto (2002) demonstrated that

goal-setting and the achievement of those goals are crucial behaviours during the transition to work. The different achievement goals were found to influence the career aspirations of young adults (Creed, Tilbury, Buys, & Crawford, 2011). In addition, this framework has proven its value in both the educational and the workplace context (Kyndt, Donche, Gijbels, & Van Petegem, 2014). As such, it facilitates the examination of the development of achievement goals in the transition to this new context.

The three orientations that are most frequently studied and are taken into account in this study are: learning-goal orientation, performance-approach orientation, and performance-avoidance orientation. Students with a high *learning-goal orientation* are focused on developing competences and performing tasks in order to learn new things (Elliot & McGregor, 2001). Students with a high *performance-approach orientation* are mainly directed towards demonstrating their competences and/or comparing them with those of others (Elliot & McGregor, 2001). Lastly, students with a high *performance-avoidance orientation* are trying to avoid tasks when they expect the consequences to be negative. In addition, it has been demonstrated that the different goal orientations can exist simultaneously (Pintrich, Conley, & Kempler, 2003). Barron and Harrackiewicz (2001) argued that, when adopting a *multiple goal perspective*, the combination of goals can optimise results. Although this perspective was frequently criticised, empirical evidence for most criticisms is lacking (Senko, Hulleman, & Harackiewicz, 2011). Consequently, a multiple goal perspective provides the opportunity to get a deeper insight in how the different achievement goals and their interaction relate to proposed outcomes.

Prior research examined the change in achievement goals in education (e.g., Shim, Ryan, & Anderson, 2008). The study of Fryer and Elliot (2007) demonstrated that approach orientations (both learning and performance) decreased over time, while performance-avoidance orientation slightly increased over time. This finding was partly confirmed by Shim et al. (2008), who found a decline in all three achievement goals over the course of one year in middle-school. Corker, Donnellan, and Bowles (2013) investigated students during their entire period in college and found a decline in learning-goal orientation and avoidance-approach orientation, whereas performance-approach orientation remained stable. Lee, Wormington, Linnenbrink-Garcia, and Roseth (2017) demonstrated relative stability when investigating the different achievement goals in university students.

Concerning its effects on work-related learning, having a learning-goal orientation was shown to have a positive effect on participation in work-related learning activities (Hurtz & Williams,

2009; Noe & Wilk, 1993). To the best of our knowledge, the effects of performance-approach and performance-avoidance orientation on work-related learning have not been examined yet. In general, however, a performance-avoidance orientation is related to more negative outcomes, while a learning-goal orientation and a performance-approach orientation are typically associated with more positive outcomes (Creed et al., 2011).

SELF-EFFICACY IN THE TRANSITION TO WORK

Self-efficacy refers to the "belief in one's own capabilities to organize and execute the courses of action required to produce given attainments" (Bandura, 1997, p. 3). Self-efficacy is a critical personal factor to increase preparedness for the transition to work (Akkermans, Nykänen, & Vuori, 2015). It has been argued that a higher self-efficacy during the period of one's education can be related to positive career-related outcomes (Akkermans et al., 2015; Bandura, 1997). On a more general level, self-efficacy has also been related to perseverance in taxing situations (Pajares, 1996), such as the transition from a familiar context to a new one. Research investigating the development of self-efficacy beliefs during (higher) education is scarce and does not provide a clear pattern. Although it is assumed that self-efficacy decreases during (higher) education, in line with the development pattern of the approach orientations (Friedel et al., 2010), Gerhardt and Brown (2006) found a general increase of self-efficacy during university.

As to the role self-efficacy plays vis-à-vis work-related learning in general, previous research has confirmed its positive effect on work-related learning (Kyndt & Baert, 2013). However, while the positive effect of self-efficacy on more formal learning activities was confirmed (Maurer, Weiss, & Barbeite, 2003; Noe & Wilk, 1993), no univocal results were found concerning informal learning activities. Whereas the study by Maurer et al. (2003) found no effect, a study of Schulz and Roβnagel (2010) confirmed the positive effect of self-efficacy on informal work-related learning activities for employees with diversified experience.

THE INTERACTION BETWEEN ACHIEVEMENT GOALS AND SELF-EFFICACY

As stated earlier, self-efficacy and achievement goals are both important during the transition to work. It should be taken into account that they are closely related, since they are both focused on how students regard and define their own capabilities (Pajares, 1996). Despite their relatedness, they should be viewed as distinct constructs: While achievement goals are considered to be related to how individuals define their capability, self-efficacy is an estimation of the level of perceived capability (Bjørnebekk, Diseth, & Ulriksen, 2013). Their relatedness has

frequently been investigated and was summarised in a meta-analysis: Whereas the correlation between self-efficacy and learning-goal orientation was moderate to strong, the correlation between self-efficacy and performance-approach was low (Huang, 2016). Moreover, self-efficacy did not correlate with performance-avoidance orientation (Huang, 2016). Whereas the meta-analysis focused on cross-sectional correlations, the study of Gerhardt and Brown (2006) focused on the development of self-efficacy in university and found that achievement goals influence the development of self-efficacy. Hence, the findings from the meta-analysis and this longitudinal study thus emphasise the need to examine the interaction between the different goal orientations and self-efficacy (Gerhardt & Brown, 2006; Huang, 2016).

PRESENT STUDY

The current study aims to get more insight in how the development of personal factors within higher education relates to work-related learning of early-career employees and, subsequently, it aims to provide a first step in advancing theory on the transition to work. More specifically, it investigates the relation between the simultaneous development of achievement goals and self-efficacy during higher education and the first period at work and work-related learning beyond graduation. To achieve this goal, three research questions are proposed.

First, this study acknowledges the dynamic character of transitions by taking the development of achievement goals and self-efficacy during the transition to work into account. As it is expected that transitional processes can trigger change in these personal factors, these developments are investigated in this study. The first research question reads as follows:

RQ1: How do self-efficacy and achievement goals develop during the transition from higher education to work?

Second, the current study will account for the variance that exists at the individual level by taking a person-centered approach (Laursen & Hoff, 2006). Fryer and Elliot (2007) pointed towards differential trajectories in achievement goals, which will be taken into account here. Moreover, the interaction between the different variables will be captured by identifying different profiles (Wormington & Linnenbrink-Garcia, 2017). *Motivational profiles* will be discerned based on the simultaneous development of the achievement goals and self-efficacy. Therefore, the second research question is:

RQ2: Which different profiles can be found, based on the conjoint development of self-efficacy and achievement goals?

Taking motivational profiles into account makes it possible to approach the transition as a process (longitudinal approach) and to capture differences between individuals (person-centered approach). By relating these profiles to work-related learning, this study can take the specific character of the transition to work into account when examining the role of self-efficacy and achievement goals in work-related learning. Moreover, unlike previous studies (Hurtz & Williams, 2009) this study contributes to research on work-related learning by including a broad range of learning activities. As such, the final research question relates to the investigation of differences in participation in work-related learning activities and their correspondence to the different latent profiles.

RQ3: Do the identified motivational profiles differ in their level of participation in work-related learning?

METHOD

DESIGN

A questionnaire was administered to final-year students across different disciplines at six higher education institutions in Belgium (one university and five university colleges). Students were invited to participate in the longitudinal research project for the first time in November 2015 (approximately one month after the start of their final year). The second wave of data collection was organised in February 2016 (at the start of the second semester of that final year), followed by a third wave in July 2016, at the time of their graduation. The fourth measurement was taken in November 2016, approximately four months after graduation.

The students were initially contacted via an email sent by their educational institution at the first, second, and third wave. From the first wave onwards, students were asked to provide contact details. Students who provided contact information were contacted directly in the second, third, and fourth wave. Every student with contact information was contacted at each wave, even those students who did not participate in all previous waves of data collection. In order to motivate students to participate in the study a gift voucher was raffled-off among the participants during each wave.

PARTICIPANTS

Across the four waves of data collection, 4421 students participated in at least one wave of the research project. This study focuses on early-career employees, which implies that it was

important to have details on the employment status of the participants four months after graduation. At the fourth wave of data collection (four months after graduation), 1479 participants indicated whether they were working, seeking a job, or had continued studying. Only participants who were employed were included in the analyses (N = 814). The majority of participants were female (female: 75.43%; male: 24.57%). The mean age of the participants was 24.58 years old (SD = 4.66).

Because only participants who had found work prior to the fourth wave of data collection were included, a backward selection of the sample was made: We started from the 814 participants who were employed and included their data of the four waves in all analyses. Therefore, the sample sizes (of included participants) at the first three waves are lower than at the fourth wave: In total, the first questionnaire was completed by 540 participants, the second by 557; and the third by 554. Complete data (i.e., participation across the four waves) were collected on 347 out of the 814 participants (42.63%). Furthermore, 205 participants completed the questionnaire three times (25.18%); 200 participated twice (24.57%); and 62 participated once (7.62%)[1].

Data were not missing completely at random (MCAR) according to Little's MCAR test (Little's MCAR test: $\chi^2(97) = 139.40$; $p = .003$). Previous research has shown that relying solely on participants with complete data provides less accurate estimates compared to including missing data using the full-information maximum likelihood estimation, especially when data are not MCAR (Allison, 2003; Enders & Bandalos, 2001). Therefore, data of all 814 participants were integrally included in the analyses, using the full-information maximum likelihood estimator.

INSTRUMENTS

To measure achievement goals the scale of Kyndt et al. (2014) was used, which consists of 16 items: eight items measured learning-goal orientation, four measured performance-approach orientation, and four measured performance-avoidance orientation. To measure self-efficacy, the 8-item scale of Chen, Gully, and Eden (2001) was translated into Dutch. At the fourth wave of data collection both instruments were adjusted to the work context (e.g., "students" was

[1] In line with recommendations in methodological literature (e.g., Allison, 2003; Wothke, 2000), we opted to include all participants in the analyses, also the 62 participants who only completed the questionnaire at the fourth wave of data collection. However, the identification of profiles was repeated excluding these participants. This provided similar results, which are provided in Appendix G.

replaced by "colleagues"). All items were measured on a 7-point Likert scale ranging from 1 ("Completely disagree") to 7 ("Completely agree"). Finally, participation in work-related learning activities was measured at the fourth wave of data collection (when graduates were employed) by the 13-item scale of Grosemans, Smet, Houben, De Cuyper, & Kyndt (2018b) which measures participation in formal learning activities (e.g., trainings, seminars; four items), informal learning activities using personal sources (e.g., reflecting on tasks, discussing with colleagues; six items), and informal learning activities using environmental sources (e.g., watching visual materials, searching for information; three items). The items measured frequency of participation in different learning activities on a 7-point Likert scale ranging from 1 ("Never") to 7 ("On a daily basis"). Sample items and descriptive statistics are provided in Table 3.1.

ANALYSES

Preliminary analyses. The analyses began with an assessment of whether the structure of the instruments could be confirmed by means of confirmatory factor analyses (CFA) using maximum likelihood robust estimation (MLR). Model fit was assessed by three indices: Comparative Fit Index (CFI), Tucker-Lewis Index (TLI), and Root Mean Square Error of Approximation (RMSEA). For the CFA, two items of the scale of learning-goal orientation were removed due to low loadings (six items remained). Afterwards, the models showed an appropriate fit at each wave, as shown in Table 3.2. The work-related learning instrument (N = 780) at the Wave 4 showed a good fit (CFI = .95, TLI = .93, RMSEA = .06; $\chi^2(62) = 230.95$).

Table 3.1. *Descriptive Statistics*

		Wave 1				Wave 2				Wave 3				Wave 4			
	Sample Item	*N*	*M*	*SD*	*α*	*N*	*M*	*SD*	*α*	*N*	*M*	*SD*	*α*	*N*	*M*	*SD*	*α*
Self-efficacy	When facing different tasks, I am certain that I will accomplish them.	540	5.13	0.78	.90	557	5.22	0.77	.91	554	5.32	0.76	.91	810	5.40	0.72	.91
Learning-goal orientation	I prefer to work on tasks that force me to learn new things.	540	5.46	0.67	.79	557	5.52	0.64	.80	553	5.58	0.64	.80	810	5.71	0.61	.79
Performance-approach orientation	I like showing that I am performing better than other students.	540	4.19	1.07	.77	557	4.25	1.11	.82	553	4.26	1.14	.84	810	4.93	0.99	.81
Performance-avoidance orientation	I choose to avoid situations in which I could perform badly.	540	3.48	1.15	.83	557	3.46	1.09	.81	553	3.37	1.13	.86	810	3.37	1.17	.85
Formal learning activities	I participated in a workshop.	-	-	-	-	-	-	-	-	-	-	-	-	780	2.42	1.08	.81
Informal - personal sources	I talked about work experiences with others.	-	-	-	-	-	-	-	-	-	-	-	-	780	5.09	1.12	.83
Informal - environmental sources	I searched for information (websites, magazines, videos, books, etc).	-	-	-	-	-	-	-	-	-	-	-	-	780	4.20	1.49	.80

Table 3.2. *Model Fit of the Confirmatory Factor Analyses at Each Wave*

Wave	CFI	TLI	RMSEA – 90% CI	$\chi^2(df)$
Wave 1	.92	.91	.053 [.047; .059]	508.88(203)
Wave 2	.93	.92	.051 [.046; .057]	501.75(203)
Wave 3	.92	.91	.056 [.050; .062]	555.51(203)
Wave 4	.94	.93	.051 [.046; .055]	627.57(203)

Subsequently, longitudinal measurement invariance (LMI) was checked (Coertjens, Donche, De Maeyer, Vanthournout, & Van Petegem, 2012). Configural and metric invariance was achieved for all scales (see Appendix F). In order to achieve scalar invariance, one intercept of self-efficacy and of learning goal orientation, respectively, were freed. For performance-approach orientation, two intercepts were freely estimated. Due to this partial LMI for those three scales, the intercept variances will be modelled in the subsequent analyses (Coertjens et al., 2012).

Investigating the development of self-efficacy and achievement goals. In order to examine the development trajectories of self-efficacy and achievement goals, its change was examined. Multi-indicator latent growth curve models with initial levels (i.e., intercepts) and slopes as latent constructs were used. Three models were estimated for each scale: a linear model, a quadratic model, and a free time scores model. As the data were gathered at unequal time intervals, unequal time scores were used to estimate the model. For the free time scores model, the two middle scores were freely estimated (Coertjens, Donche, De Maeyer, van Daal, & Van Petegem, 2017). To examine which model fitted the data best, the Akaike Information Criterion (AIC) and Bayesian Information Criterion (BIC) were used as well as a model comparison based on the chi-square test with Satorra-Bentler scaling (Muthén & Muthén, 2015; Satorra & Bentler, 2010).

Identifying latent growth profiles. The second research question concerned the estimation of different latent profiles based on participants' growth trajectories with respect to self-efficacy and achievement goals. Therefore, the different growth trajectories of the variables were combined in a multi-indicator parallel process growth curve model (Wickrama, Lee, O'Neal, & Lorenz, 2016). Afterwards, a multidimensional latent class growth analysis (LCGA) was used to identify latent profiles of participants with similar growth trajectories for both self-efficacy and achievement goals (Jung & Wickrama, 2008). Different models (from one to six profiles) were

compared. The comparison of the models was guided by their BIC in which smaller values are considered to indicate better model fit (Grimm, Ram, & Estabrook, 2016), the Vuong-Lo-Mendell-Rubin Likelihood Ratio test (LMR) and the Bootstrap Likelihood Ratio test (BLRT), which have been shown to be reliable tests for making a decision on the number of profiles (Nylund, Asparouhov, & Muthen, 2007). Furthermore, in order to decide on the final model the entropy was taken into account (Jung & Wickrama, 2008).

Examining differences in work-related learning. Lastly, we checked whether the profiles identified based on their latent growth trajectory differed in their (level of) participation in work-related learning activities. Therefore, a multivariate analyses of variance (MANOVA) was conducted using Pillai's Trace test statistic, which is a positive-valued statistic. Pillai's Trace was selected, because of its robustness to model violations (Olson, 1976).

The MANOVA was performed using SPSS software (version 24); all other analyses were conducted using Mplus software (version 7.1.4). The Mplus syntax files and corresponding data set are available on request to the authors.

RESULTS

DEVELOPMENT OF SELF-EFFICACY AND ACHIEVEMENT GOALS

Self-efficacy. Both the linear and the quadratic latent growth models revealed a good fit. However, the estimate of the quadratic term was not significant (q = -.01, se = .08, p = .905), indicating that this was not the best model for capturing the data. The free time scores model was not significantly better than the linear model based on the AIC, the BIC, and the chi-square test ($\Delta\chi^2(2) = 2.29$, p = .360). As the most parsimonious model is generally preferred (Iacobucci, 2009), it was concluded that the *linear model* fitted the data best. This model indicated that students' self-efficacy on average followed a linear increasing trend during the final year and the transition to work (see Table 3.3). The loglikelihood ratio chi-squared test with Satorra-Bentler correction indicated the significance of the variance of the slope, demonstrating that students differed in their growth over time. Furthermore, the covariance between intercept and slope was significant and negative, demonstrating that a higher increase is found for students with a lower starting point of self-efficacy.

Learning-goal orientation. The *linear model* was selected as optimal model, based on the chi-square test (compared to quadratic: $\Delta\chi^2(1) = 3.32$, p = .068; compared to free time scores: $\Delta\chi^2(2) = 5.35$, p = .069) and the BIC values. Based on the significant slope, it was concluded

that students on average follow a positive linear trend in learning-goal orientation. The variance of the slope was also significant, providing evidence for differential growth. Moreover, the covariance was significant and negative, indicating that students with a lower starting point of learning-goal orientation experienced a higher increase during (preparation for) the transition to work.

Performance-approach orientation. Whereas the linear model showed a good fit, the quadratic model fitted the data better ($\Delta\chi^2(2) = 126.34$, $p < .001$). Due to a negative (but insignificant) residual variance of the latent factor at the fourth wave, the variance of the slope was fixed to zero in order to correctly estimate the free time scores model, based on the suggestion of Muthén (2007). Consequently, the quadratic and free times scores model have equal degrees of freedom, implying that these models could not be compared as the chi-square test could not be conducted. However, based on the fit indices and BIC value indicated the *free time scores model* was selected as best model for performance-approach orientation. The results showed that no significant increase could be found for the first semester of the final year of higher education. Additionally, no change occurred during the second semester. The largest increase (95% of the total increase) occurred after graduation. As the variance of the slope had to be fixed to zero, the slope variance and covariance could not be examined.

Performance-avoidance orientation. The linear, quadratic, and free time scores growth models yielded a good fit. However, the estimate of the quadratic term was not significant ($q = .14$, $se = .15$, $p = .344$). The free time scores model did not provide a better fit than the linear model based on the fit indices and the non-significant chi-square test ($\Delta\chi^2(2) = 2.03$, $p = .363$). Hence, the *linear model* was selected as best model for performance-avoidance orientation. Based on the negative and significant slope, it was concluded that performance-avoidance orientation on average decreases during the students' final year of higher education until the first four months after graduation. Furthermore, the variance of the slope was significant, demonstrating that students differed concerning their growth trajectory. The covariance between intercept and slope was negative and significant, indicating that students with a lower starting point experienced a smaller decrease in performance-avoidance orientation.

Table 3.3. *Intercepts and Slopes of the Selected Growth Models*

		Intercept			Slope			Covariance	
		Mean	Variance		Mean	Variance			
		Estimate	Estimate (*SE*)	$\Delta \chi^2(df)$	Estimate (*SE*)	Estimate (*SE*)	$\Delta \chi^2(df)$	Estimate (*SE*)	$\Delta \chi^2(df)$
Self-efficacy	Linear	0	0.262 (0.032)	214.34(2); $p < .001$	0.212*** (0.024)	0.083 (0.036)	29.74(2); $p < .001$	-0.100 (0.024)	27.06(1); $p < .001$
Learning-goal orientation	Linear	0	0.436 (0.045)	198.69(2); $p < .001$	0.246*** (0.032)	0.185 (0.058)	40.17(2); $p < .001$	-0.172 (0.037)	68.89(1); $p <.001$
Performance-approach orientation	Free time scores	0	0.563 (0.063)	157.68(2); $p < .001$	0.938*** (0.056)	0	-	0	-
Performance-avoidance orientation	Linear	0	0.844 (0.078)	275.30(2); $p < .001$	-0.133** (0.044)	0.322 (0.115)	9.45(2); $p = .009$	-0.139 (0.070)	4.11(1); $p = .043$

Note. The mean of the intercept is fixed to zero in latent growth curve models in which the measurement model is taken into account (Muthén & Muthén, 2015).
** $p < .01$, *** $p < .001$.

IDENTIFICATION OF DIFFERENT LATENT GROWTH PROFILES

Firstly, a parallel process growth curve model was estimated, based on the selected growth trajectories per variable. When combining the different growth trajectories, the variance of the slope of learning-goal orientation showed a small negative but insignificant residual variance and was therefore fixed to zero. The fit of this model was appropriate (CFI = .90, TLI = .90, RMSEA = .03) and was used as a starting point for the multidimensional latent class growth model (LCGA).

Secondly, LCGAs (with one to six profiles) were estimated. According to the BIC values, model fit improvements could be observed for up to six profiles, although according to the LMR test the four-profile model fitted the data best (see Table 3.4). Moreover, the BLRT comparing the four-profile model with the three-profile model indicated that the four-profile model was preferred ($p < .001$). As the entropy of the four-profile model was acceptable (>.60; Wickrama et al., 2016), this model was selected as the final model.

Table 3.4. *Goodness of Fit for the Different Models*

Number of profiles	BIC	Entropy	LMR	
			Value (Δ parameters)	*p*
1	139060.78	-	-	-
2	137811.42	.746	-68572.01(9)	< .001
3	137260.44	.778	-67917.17(9)	.036
4	136845.79	.788	-67611.52(9)	.034
5	136678.92	.771	-67374.04(9)	.677
6	136511.04	.786	-67268.07(9)	.257

The growth trajectories of all profiles are depicted in Figure 3.1 and the parameters are shown in Table 3.5. Generally, it can be concluded that the main differences between the profiles can be found in the starting values, while the differences in the slopes (based on the 90% confidence intervals of the parameter estimates) are limited. Concerning the slopes, all four profiles demonstrate the growth patterns that were found earlier for self-efficacy and performance-approach orientation (i.e., linear increase). Limited differences in slopes are found

for learning-goal orientation and performance-avoidance orientation. When focusing on the profiles separately, the first is referred to as the *'strongly efficacious and approach-oriented profile'*, because students in this profile are characterised by high starting values on both performance-approach orientation and learning-goal orientation. This is coupled with high starting values of self-efficacy. Furthermore, these students show a significant increase in performance-approach orientation, learning-goal orientation, and self-efficacy during their final year and the transition. Simultaneously, they show a low initial value of performance-avoidance orientation and a significant decreasing trend for the latter. Students in the second profile experience a similar growth trajectory as students in the first profile (i.e., no differences in the slope estimates were found compared to the first profile). However, they differ from students in the first profile in their lower starting values for self-efficacy and learning-goal orientation, and higher starting values for performance-avoidance orientation. Therefore, this profile is named the *'moderate efficacious and approach-oriented profile'*.

In contrast to the growth patterns in the first two profiles, the third and fourth profile are both characterised by a stable learning-goal orientation and performance-avoidance orientation. The third profile is referred to as the *'moderate efficacious and learning-oriented profile'*, as moderate starting values of learning-goal orientation and self-efficacy can be found, with significant increasing self-efficacy during the transition. Furthermore, students in this profile showed low starting values of both performance-approach and performance-avoidance orientation. However, their performance-approach orientation increased significantly during the transition. The last profile is labelled the *'undecided motivational profile'*, as students in this profile show a constantly low learning-goal orientation and a constantly high performance-avoidance orientation. On top of this, moderate but significant increasing values for performance-approach orientation are found in combination with low but significant increasing values for self-efficacy.

Table 3.5. *Results of the Final LCGA with Four Latent Profiles*

Growth parameters [90% CI]		Profile 1 (*N* = 143)	Profile 2 (*N* = 339)	Profile 3 (*N* = 194)	Profile 4 (*N* = 138)
Self-efficacy	Intercept	1.268***	0.685***	0.658***	0.000
		[1.095; 1.441]	[0.545; 0.826]	[0.486; 0.830]	
	Slope	0.112*	0.249***	0.181***	0.254**
		[0.033; 0.191]	[0.170; 0.328]	[0.099; 0.263]	[0.121; 0.387]
Learning-goal orientation	Intercept	1.415***	0.608***	0.753***	0.000
		[1.218; 1.613]	[0.408; 0.809]	[0.496; 1.011]	
	Slope	0.218***	0.340***	0.125	0.197
		[0.123; 0.312]	[0.232; 0.447]	[-0.034; 0.283]	[0.012; 0.382]
Performance-approach orientation	Intercept	0.556**	0.613***	-0.725**	0.000
		[0.221; 0.89]	[0.335; 0.891]	[-1.124; -0.323]	
	Slope	0.875***	0.844***	0.974***	0.910***
		[0.691; 1.059]	[0.737; 0.951]	[0.803; 1.145]	[0.747; 1.073]
Performance-avoidance orientation	Intercept	-1.595***	-0.127	-1.482***	0.000
		[-1.937; -1.253]	[-0.521; 0.267]	[-1.805; -1.159]	
	Slope	-0.286**	-0.217***	-0.071	0.095
		[-0.460; -0.112]	[-0.350; -0.084]	[-0.233; 0.090]	[-0.100; 0.291]

Note. In a LCGA, the intercepts of the last profile are fixed to zero.

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

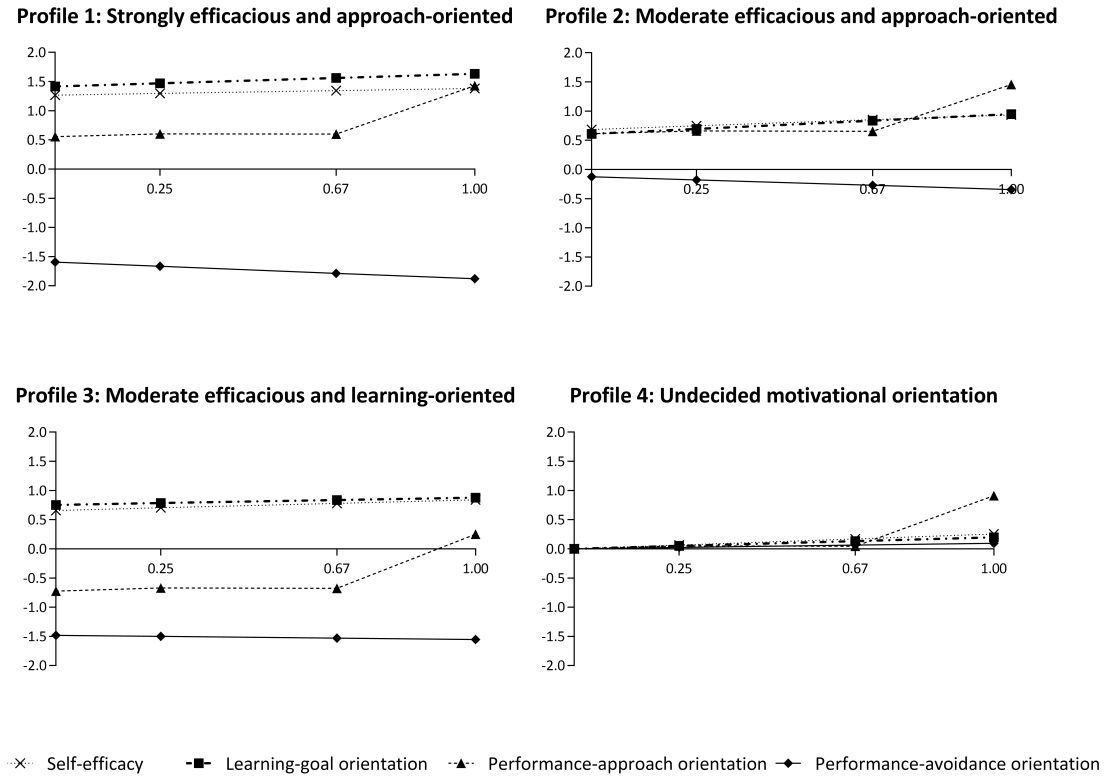


Figure 3.1. Growth Trajectories for Multidimensional Latent Profiles

DIFFERENCES IN WORK-RELATED LEARNING

To investigate whether the participation in work-related learning activities differed for the four identified profiles (based on profile membership as a result of the LCGA), a MANOVA was performed. The results showed significant differences between the motivational profiles using Pillai's trace (V = .03, F(9,774) = 2.56, p = .006). The follow-up univariate analyses of variance (ANOVAs) revealed significant albeit small effects for formal learning activities (F(3,776) = 2.80, p = .039, η^2 = .01) and for informal learning activities using personal sources (F(3,776) = 5.72, p = .001, η^2 = .02). The ANOVA for informal learning activities using environmental sources tended to demonstrated differences, although the p-value was slightly above the alpha level (F(3,776) = 2.56, p = .054, η^2 = .01). A Bonferonni post-hoc test was conducted to investigate the differences between the profiles (see Table 3.6). The *'strongly efficacious and approach-oriented profile'* reported significantly more formal learning activities and informal learning activities using personal sources than the *'moderate efficacious and approach-oriented profile'* and more informal learning activities using personal sources than the *'undecided motivational profile'*. Furthermore, early-career employees in this *'undecided profile'* showed less informal learning activities using personal sources than those in the *'moderate efficacious and learning-oriented profile'.*

Table 3.6. *Means of Work-Related Learning Activities for Motivational Profiles*

		Profile 1	Profile 2	Profile 3	Profile 4
		(N = 137; 17.56%)	*(N = 324; 41.54%)*	*(N = 189; 24.23%)*	*(N = 130; 16.67%)*
Formal learning	*M (SD)*	2.66 (1.18)	2.36 (1.08)[a]	2.40 (0.98)	2.34 (1.10)
Informal learning – personal sources	*M (SD)*	5.34 (1.14)	4.99 (1.17)[a]	5.23 (1.03)	4.88 (0.99)[b,c]
Informal learning – environmental sources	*M (SD)*	4.49 (1.56)	4.11 (1.46)	4.22 (1.42)	4.05 (1.54)

Note. [a] Profile 2 significantly different from profile 1.

[b] Profile 4 significantly different from profile 3.

[c] Profile 4 significantly different from profile 1.

CONCLUSION AND DISCUSSION

The present study investigated the role of self-efficacy and achievement goals in work-related learning of early-career employees with specific attention to the dynamic character of the transition from higher education to work. More specifically, this study examined the development of self-efficacy and achievement goals during the final year of higher education until four months after graduation. Although achievement goals are frequently investigated as more stable constructs in the transition to work (Tuominen-Soini, Salmela-Aro, & Niemivirta, 2011), it can be concluded that both self-efficacy and learning-goal orientation increased on average. The result concerning learning-goal orientation is surprising when compared to general tendencies in education apart from this specific transition process: Prior research investigating the development of learning-goal orientation demonstrated that in general it decreased or remained stable (Corker et al., 2013; Fryer & Elliot, 2007; Shim et al., 2008). Consequently, these results contribute to research on achievement goals by taking the final year of higher education and the first months at work into account. The results suggested that, in contrast to general development, the preparation for the transition to work triggers change in self-efficacy and learning-goal orientation. For performance-avoidance orientation, in line with prior research (Shim et al., 2008), a decrease was found during the preparation for the transition to work and the first months at work.

In contrast to these linear growth trajectories, for performance-approach orientation a free time scores model was retained. It was found that 95% of the change in performance-approach orientation occurred between graduation and four months after graduation, in the period when most graduates started their employment. This implies that performance-approach orientation remained stable during the final year of higher education, which is in line with prior research (Corker et al., 2008). This finding suggests that change was triggered due to the switch in context, with performance-approach orientation gaining importance in the working context. Prior research on other transition processes (e.g., transition from secondary to higher education) has indeed shown that performance-approach orientation played a more prominent role compared to learning-goal orientation (Barron & Harackiewicz, 2001). An additional explanation for this phenomenon in the transition to work is that a working context is often a new and more uncertain environment (Le Maistre & Paré, 2004). As a result early-career employees are frequently concerned with making a good impression and, to this end, aim to demonstrate their competences. Moreover, graduates with a background in higher education are confronted with a competitive job market and their jobs are therefore often more oriented

towards performance rather than towards learning (e.g., Tomlinson, 2012), which could explain the relative importance of performance-approach orientation in this specific transition process.

The second research question entailed the identification of latent profiles based on the combination of the growth trajectories of self-efficacy and achievement goals. Adopting a longitudinal person-centered approach enabled us to detect four distinct motivational profiles, indicating that individuals vary in their development in achievement goals and self-efficacy during (preparation for) the transition to work (Creed et al., 2011). When taking a closer look at the differences between the profiles, it can be noticed that the profiles differ in the degree to which they endorse the different aspects of the motivational profiles: Whereas, for example, the *'strongly efficacious and approach-oriented profile'* clearly reported high scores on both learning-goal and performance-approach orientation, the *'moderate efficacious and learning-oriented profile'* also reports high values on learning-goal orientation, but rather low values on performance-approach orientation. Consequently, it should be noted that the true differences between the motivational profiles could mainly be found in differences in the starting values (i.e., values at the start of the final year of higher education). As such, it can be concluded that students' achievement goals and self-efficacy established in higher education play an important role in their subsequent transition process, which underpins the theory that preparation is an important part of transition processes (Nicholson, 1990). Accordingly, it would be interesting to investigate how the higher education context could foster self-efficacy and achievement goals in students in the process of moving towards work (Pintrich et al., 2003).

Concerning the third research question, differences were found in participation in work-related learning activities between the profiles. Lowest levels of participation in informal learning activities using personal sources were found for the *'undecided motivational model'*. Graduates in the latter profile reported significantly lower levels than the *'moderate efficacious and learning-oriented profile'*, which suggests that especially learning-goal orientation and self-efficacy are important for work-related learning, in line with prior research (Kyndt & Baert, 2013). The *'strongly efficacious and approach-oriented profile'* showed most participation in work-related learning activities. This result is in favour of the *interactive goal effect* as described by Barron and Harackiewicz (2001), implying that the combination of approach orientations enhances a positive outcome independent of the main effects of each of the single orientations: Most participation in work-related learning takes place when high levels of learning-goal orientation and performance-approach orientation are combined.

Despite the interesting theoretical findings, the effect sizes for the ANOVAs in this study were rather small. These small effect sizes could be attributed to the fact that the transition to work is a process in which major changes occur. Due to the multiple facets of the transition, it is likely that other variables contribute to work-related learning, such as career competences (Kyndt & Baert, 2013; Noe & Wilk, 1993) or anxiety (Maurer et al., 2003). These personal factors and their development may have some influence on work-related learning after graduation, which could be examined in future research. Although not the focus of the current study, prior research indicated that some contextual factors are of importance for work-related learning, for example work domains or sector (Kyndt & Baert, 2013). While this study did not take these factors into account, the used instrument measuring work-related learning was validated in a heterogeneous sample and measurement invariance was demonstrated across sectors (Grosemans et al., 2018b). Besides including additional personal factors, future research could take contextual aspects of the first job into account when investigating work-related learning of early-career employees.

Despite its value, it has to be acknowledged that this study comes with a number of limitations. First, this study aimed at getting more insight in work-related learning of early-career employees. Therefore, only those graduates who had found work within a period of four months after graduation were included in the analyses. However, it could be argued that graduates with a stronger motivational profile found a job more easily and that finding a job influenced their achievement goals at the last wave of data collection (Elliot & McGregor, 2001). As such, the results of this study should not be generalised to all graduates in the transition from higher education to work. It would be an interesting avenue for future research to investigate the motivational profiles of unemployed graduates or to include a larger time span (i.e., collecting data at a moment when more graduates found work).

A second limitation refers to the measurement of the different achievement goals. The items in the used measurement instrument are encompassing a goal and a motive simultaneously (Hulleman, Schrager, Bodmann, & Harackiewicz, 2010). Despite the value of this type of measurement, it is “difficult to know exactly which aspect of the achievement goal should be considered responsible for any hypothesized or observed effects” (Elliot & Thrash, 2001, p. 141), as goals and motives are demonstrated to be both specific and overlapping (Sommet & Elliot, 2017). Therefore, it would be interesting to replicate the findings including measures for both achievement goals and for the motives to pursue these goals (Sommet & Elliot, 2017).

Third, all measures included in this study relied on self-reported estimations of the individuals during the transition to work, which raises the question of self-report bias (Spector, 1994). Nonetheless, according to Spector (1994) self-report measures are an acceptable way of retrieving information on achievement goals and self-efficacy. To measure work-related learning, however, future research could alleviate concerns about potential bias by adding measures completed by other individuals such as colleagues or supervisors (Simmering, Colquitt, Noe, & Porter, 2003).

A final limitation that needs to be discussed concerns a common limitation in longitudinal research: missing data. Despite the effort that was made to maximise participation during the four waves, not every respondent participated every wave. Furthermore, because of the focus on work-related learning of early-career employees, we could only include those participants that provided information on their employment status at the fourth wave of data collection. However, missing data techniques were applied in order to limit the bias (Enders & Bandalos, 2001). In total, 814 participants were included in the analyses and complete data were available for 42.63% of those participants, providing a sample that was large enough to apply missing data techniques and to draw conclusions.

The present study contributes to theory on the transition to work by investigating different profiles of students longitudinally during the transition from higher education to work. The results indicate that self-efficacy, learning-goal, and performance-approach orientation increase and performance-avoidance orientation decreases, suggesting that the preparation for the transition triggers change in these personal factors. Furthermore, distinct motivational profiles were identified, providing evidence that personal factors and their development vary for different individuals. Moreover, the interactive effect of multiple goal orientations on engagement in work-related learning activities of early-career employees was illustrated. As such, this study has contributed to the research on the transition from higher education to work by focusing on personal factors and relating motivational profiles of students to differences in outcomes after graduation. Hence, this study shows the value of adopting a longitudinal person-centered approach in studying the transition process.

Chapter 4

THE RELATIONSHIP BETWEEN EDUCATION-JOB FIT AND WORK-RELATED LEARNING OF RECENT GRADUATES: CAPITALISING ON A HEAD START OR FILLING A GAP?



This chapter is based on Grosemans, I., Vangrieken, K., Coertjens, L., & Kyndt, E. (2018). *The relationship between education-job fit and work-related learning of recent graduates: Capitalising on a head start or filling a gap?* Manuscript submitted for publication.

ABSTRACT

The alignment of the first job and graduates' education appears to be of key influence on graduates' career paths. As such, it is argued that fit affects work-related learning, which is important for starting employees to be able to cope with the demands of their new job. Theoretically, two (contradicting) processes have been put forward describing the relationship between education-job fit and work-related learning: Whereas the *complementing* hypothesis argues that work-related learning builds on an existing and appropriate set of competences, the *substituting* hypothesis assumes that work-related learning can compensate in case of misalignment. This study aims to empirically assess these contradicting hypotheses by identifying latent profiles of recent graduates (N = 779) and comparing differences regarding work-related learning across the profiles. Four distinct profiles were identified: full fit, horizontal fit, vertical fit, and full misfit. The results provided support for the complementing hypothesis, arguing that continued learning at work complements what was learned during higher education. Furthermore, this study refined existing theory on this relationship by demonstrating how the fit profiles differently influence formal and informal learning activities. Moreover, the relationship between education-job fit and work-related learning was found to be sustained six months later into the job.

Keywords: *education-job fit; vertical fit; horizontal fit; work-related learning; transition to work*

INTRODUCTION

For many young adults, entering a first job after graduation is an important turning point in their lives. Similarly, prior research demonstrated that the characteristics of the first job after graduation can have long-term effects on graduates' careers, both in terms of job quality and quantity (e.g., Baert, Cockx, & Verhaest, 2013). The alignment of this first job and graduates' education appears to be very important. Prior studies investigating the fit between work and education of graduates primarily focused on economic outcomes such as career success, operationalised as wages or promotion opportunities (Groot & Maassen van den Brink, 2000; McKee-Ryan & Harvey, 2011). However, although they are mostly neglected in previous research, non-economic outcomes are of key importance to graduates' careers as well. McKee-Ryan and Harvey (2011) demonstrated beneficial effects of the fit between educational background and the first job, for example, in terms of wellbeing and career satisfaction. Likewise, work-related learning can be argued to be one of the key outcomes of fit when taking a career perspective, because of its importance for both individuals and organisations to be able to cope with changes in a work environment. While all graduates entering their first job learn in some way at work, their experienced fit situation has been argued to strongly affect their learning behaviour (Brunello, 2004). However, in what way fit influences learning on the job – whether fit fosters or hampers learning – remains up for debate.

In trying to increase the understanding of these dynamics, two contradicting processes have been put forward to explain the relationship between education-job fit and work-related learning. First of all, a *complementary process* between both is suggested by research taking a human capital perspective, arguing that work-related learning *complements* an existing and appropriate set of competences (Brunello, 2004). It is assumed that education increases the efficiency of work-related learning (Verhaest & Omey, 2013). Following this perspective, it is expected that employees who are in a job that fits their educational background participate more in work-related learning activities. In this way, a fitting educational background provides recent graduates with a *head start* for work-related learning. In contrast, other studies argue that work-related learning could *substitute* for prior education in case of a misfit, which implies that employees who are in a job that does not fit their educational background participate more in work-related learning (Heijke, Meng, & Ris, 2003). In this way, work-related learning is supposed to *fill a gap* in case of misalignment between the job and employees' educational background.

Despite theorising on the topic, only a limited number of studies examined this relationship empirically (e.g., Büchel & Mertens, 2004; Brunello, 2004; Heijke et al., 2003). As these studies also found mixed results, it is difficult to discern which of the proposed processes is most prominent. Moreover, the limited empirical studies on this topic show substantial shortcomings and the mixed results partially depend on different understandings and inconsistent or incomplete operationalisations of the constructs. First, studies have included different types of fit. Most research focused on *vertical fit*, including the extent to which the obtained and required level of education are aligned (Leuven & Oosterbeek, 2011). Recently, research has put more emphasis on the fit between the field of study and the job, referred to as *horizontal fit* (Wolbers, 2003). This demonstrates that the concept of education-job fit is not one-dimensional and that the effects may be different depending on which type of fit is being investigated. Second, work-related learning is often interpreted in a narrow way, focusing on formal learning or training (e.g., Brunello, 2004 van Smoorenburg & van der Velden, 2000). These studies ignored the opportunities to learn in an informal way (e.g., asking feedback from colleagues), although informal learning opportunities are omnipresent in most work environments (Lohman, 2006). Hence, no previous study was able to grasp the full spectrum of work-related learning to investigate whether or not effects of education-job fit differ across various types of work-related learning. Consequently, this study aims to address these key shortcomings and empirically test the contradicting explanations for the relationship between education-job fit and work-related learning of recent graduates by including different types of fit (1) and by taking a broad range of learning activities into account (2). In this way, this study contributes to the field by providing a more fine-grained understanding of the complex relationship between education-job fit and graduates' learning behaviours at work. In the following sections, we will elaborate on education-job fit, work-related learning, and the relation between both.

THEORETICAL FRAMEWORK

EDUCATION-JOB FIT

The fit between employees' educational background and their current job has increasingly been investigated and most attention has been devoted to recent graduates (Heijke et al., 2003; Groot & Maassen van den Brink, 2000). The topic of fit has important implications for practice, including policy makers and organisations. The rising incidence of misfit results in a loss of (potential) resources at an organisational and societal level (e.g., difficulties in selection processes; frictions in the labour market) (Leuven & Oosterbeek, 2011). However, most outcomes of fit were identified at the individual level, in which misfit results in extensive negative

outcomes for employees (McKee-Ryan & Harvey, 2011). As such, McKee-Ryan and Harvey (2011) identified several personal outcomes (e.g., wellbeing), job outcomes (e.g., performance), and career outcomes (e.g., wages). However, as suggested before, previous research on the topic shows some limitations that hamper a thorough understanding of education-job fit and its implications. First of all, although different types of education-job fit can be assessed – vertical and horizontal – most studies do not take (the combination of) both into account. Second, variations in the way in which fit is measured result in inconsistencies across different studies.

Vertical and horizontal fit. First of all, *vertical fit* concerns the degree to which graduates' educational level fits the required educational level of their current job (Leuven & Oosterbeek, 2011). Vertical *misfit* is manifested in two different situations. The situation in which the educational level of the employee is higher than the required educational level for their current job is called *overeducation* or underemployment. Overeducation tends to be quite common (Groot & Maassen van den Brink, 2000; McKee-Ryan & Harvey, 2011), given the overall rise of the mean level of education in the population. A growing trend is found in the completion rates of tertiary education: Whereas 26% of the population of OECD countries aged 25-34 years graduated in tertiary education in 2000, this percentage increased up to 43% in 2016 (OECD, 2017). This leads to an increase in the supply of workers with a degree in higher education, which potentially creates a tension between the supply and demand of employees, especially when the demands of the labour market are not adapting at the same pace (Groot & Maassen van den Brink, 2000). A situation of *overeducation* is generally considered to be inadequate, as most research referred to this situation as an overinvestment in education and/or underutilisation of educational skills which is a concern given the large investments in education (Verhaest & Omey, 2006). In contrast, in a situation of *undereducation* or overemployment the level of education is lower than the required level for the job. The incidence of undereducation is quite low, which is not surprising given the demonstrated increase of the overall educational level of the population in Europe (Verhaest & Omey, 2006). Ample studies indicated that the prevalence of vertical misfit in general in the transition is relatively high (Grosemans, Coertjens, & Kyndt, 2017), in which the incidence ranged from 42% to 85% across studies (e.g., Maxwell & Broadbridge, 2014; Teichler, 2007).

Second, *horizontal fit* includes the degree to which employees' field of study is in line with the field of study that is required by their job (Verhaest, Sellami, & Van der Velden, 2017). A common theme in the transition to work involves the degree to which higher education should provide their graduates with job-specific knowledge or with a broader range of knowledge (Teichler, 2007). Many programmes in higher education are putting a larger emphasis on

academic skills, in contrast to the more specific skills that were emphasised before (Grosemans et al., 2017). Given that the possible career trajectories for graduates are numerous nowadays, higher education can never provide their graduates with all necessary knowledge, skills, and attitudes. The wide range of career trajectories creates more flexibility for individuals, thereby also creating possibilities for a misalignment between the content of their educational background and their job. Prior research has indicated that the incidence of horizontal fit varied between 38% and 82% (e.g., Heijke et al., 2003; Teichler, 2007).

Measuring education-job fit. Education-job fit is measured in a variety of ways in prior research, resulting in strong variations in the reported incidences of fit. This is demonstrated by Verhaest and Omey (2006), who measured fit using different measures in the same data set and found that the incidence of overeducation ranged from 8% to 51%, depending on which measurement was used. Leuven and Oosterbeek (2011) discerned three ways of measuring fit. A first approach is often referred to as a *subjective* method, including a self-assessment approach that questions employees about the requirements of their job. Overall, it is found that employees overestimate the requirements of their job, which may be a consequence of a social desirability bias (Hartog, 2000; Leuven & Oosterbeek, 2011). In combination with the overall rise in employees' educational level described above, this results in relatively high incidences of fit. A second way of measuring fit is considered to be a more *objective* method. This method starts from a description of the employee's job and his/her educational background. An external rater then classifies theses descriptions to decide on employee's fit. Studies using this method usually report lower incidences of fit. It may even underestimate fit, as the classification systems to conduct the job analysis struggle to keep up with the changes in the contents of both existing and newly created jobs (Verhaest & Omey, 2006). A final method starts from *realised matches* and is a statistical method to determine the incidence of fit. This method infers the required level of education by using the actual distribution of educational levels from all employees with the same occupation to estimate the probabilities of fit. A limitation of this method involves its dependence on structural factors in the labour market (e.g., demand and supply), ignoring variation across employees (Leuven & Oosterbeek, 2011).

In conclusion, education-job fit is a well-researched topic, especially in the case of recent graduates. However, true advancement of the field is hampered because of the difficultly to compare results of different empirical studies. A first reason for their incomparability refers to the fact that different types of education-job fit (i.e., vertical and horizontal fit) are taken into account. The potential effects of their combination were largely neglected up until now, despite their importance (Verhaest et al., 2017). Second, different measures are used (i.e., subjective,

objective, or realised matches), which each have their own advantages and disadvantages (Leuven & Oosterbeek, 2011). Therefore, when aiming to draw reliable conclusions about fit, multiple measures need to be taken into account to limit the measurement errors of a single measure (Verhaest & Omey, 2006).

WORK-RELATED LEARNING IN THE TRANSITION TO WORK

The ability to apply what is learned in education is frequently considered an important predictor for labour market success and education is expected to prepare students to enter the labour market successfully (Robst, 2007). Hence, it is often assumed that graduates have developed the necessary knowledge, skills, and attitudes to be able to perform in their new job (Heijke et al., 2003). However, this assumption is generally too optimistic, as educational programmes can never provide graduates with all necessary knowledge, skills, and attitudes for an entire career, especially given the level of flexibility, adaptation, and innovation that is expected nowadays (Teichler, 2007). This indicates how the need for learning does not stop after graduation: Employees need to continue to learn at work. Such work-related learning is defined by Kyndt and Baert (2013) as participation in learning activities that can be either formal or informal, which lead to an improvement in competences and eventually contributes to individuals' and/or organisational performance. This definition points to the nature of the learning activities that can be formal or informal. *Formal learning activities* are those activities that are structured and planned in time, for which the goals are clear (e.g., seminars). Informal learning activities are embedded in daily work and are generally less structured (e.g., discussing problems with colleagues) (Kyndt & Baert, 2013). As informal learning gets a central role in daily life, a broad range of learning activities is considered to be informal. Therefore, informal learning is often divided into subcategories (Berg & Chyung, 2008). Grosemans, Smet, Houben, De Cuyper, & Kyndt (2018b) make a distinction based on the used source of learning, in which two forms are distinguished: learning using personal and environmental sources. *Informal learning using personal sources* concerns learning from interacting with others (such as colleagues or supervisors) or learning from oneself. Examples are asking information from others, observing how others perform a certain task, or reflecting on a task. *Informal learning using environmental sources*, in contrast, involves learning behaviour using sources present in the environment, for example reading a book or watching visual material (Grosemans et al., 2018b). Previous research predominantly focused on formal learning activities, mostly limiting formal learning to one specific aspect, namely participation in training programmes (Hurtz & Williams, 2009). Solely focusing on formal learning however ignores the central role of informal learning at the workplace (Lohman, 2006). Hence, in order to get a more fine-grained view on the role of work-

related learning, it is essential to consider a broad range of both formal and informal learning activities (Berg & Chyung, 2008).

Relating work-related learning to the transition to work, prior research indicated that learning at work gets a prominent role especially at the very start of the job, when graduates encounter ample new challenges (Le Maistre & Paré, 2004; Nicholson, 1990). Graduates will need to cope with this new working context, which inherently creates numerous learning opportunities. Nicholson (1990) stated that after this first encounter stage; graduates will need some time to adjust to their job (i.e., adjustment stage) to finally reach the stabilisation stage in which they are settled in the job. Renn and Hodges (2007) demonstrated that the degree to which graduates felt competent to perform their job varied across the different stages, indicating that different stages within the transition to work can be important for outcomes during the transition to work (such as work-related learning).

In sum, when focusing on recent graduates, both the encounter stage and adjustment stage are particularly important as being the first stages at work: Within the encounter stage, graduates will be confronted with ample challenges, which provide numerous opportunities to learn (Nicholson, 1990). In the adjustment stage, personal change related to work is central, which also involves additional learning. Although learning is argued to have a prominent role in both stages, it is expected that most learning is likely to occur during the first encounter stage when graduates experience the largest 'reality shock' before adjusting to their new job (Nicholson, 1990).

RELATIONSHIP BETWEEN FIT AND WORK-RELATED LEARNING

Two contradicting processes are suggested at a theoretical level with regard to the relationship between education-job fit and work-related learning. The question whether education and learning at work are complements or substitutes is an on-going topic in literature on education-job fit.

Complementing hypothesis. The idea that education-job fit and work-related learning are complementary and that learning complements an already existing and appropriate set of competences goes back to the human capital theory (Becker, 1964). Within this theory, ability, education, and training are considered to be key concepts (van Eijs & Heijke, 2000). It is assumed that graduates' human capital is mainly represented by their knowledge and skills acquired within education (Wolbers, 2003). This established human capital enables graduates to further develop their competences and is argued to stimulate the participation in work-

related learning activities, providing recent graduates with a head start. When focusing on productivity of organisations, one should strive for an optimal fit between education and job as these employees will be able to build on their existing competences, which enhances productivity (Brunello, 2004). At the individual level, human capital theory assumes that additional learning is easier when the correct set of skills is available, supporting the complementing hypothesis (Brunello, 2004).

Although the complementing relationship is put forward theoretically, it has rarely been investigated in the transition to work. Most studies find support for this hypothesis when comparing different educational levels (i.e., related to vertical fit issues): Overall, individuals with a background in higher education tend to invest more in training than their lower-educated peers (Brunello, 2004; Verhaest & Omey, 2013). Moreover, Verhaest and Omey (2013) detected that overeducated employees acquired fewer skills than their peers who experienced a fit between their education and their job. Similarly, Beneito, Ferri, Moltó, and Uriel (2000) and Büchel and Mertens (2004) found that training participation was lower for overeducated employees. To the best of our knowledge, the complementing hypothesis was not investigated in empirical studies on horizontal fit.

Substituting hypothesis. The substitution hypothesis starts from the premise that work-related learning could replace the educational function and fill a gap between a graduate's educational background and the knowledge and skills required for the job (Heijke et al., 2003). This premise is in line with the idea that employees participate in work-related learning activities when they experience a need to participate, as described in the theory of reasoned action (Kyndt & Baert, 2013). According to this theory, employees will participate in learning activities because they experience a need to acquire or improve competences in order to perform in their job (Verhaest & Omey, 2013). Although the substitution hypothesis is a common way of thinking in the case of horizontal misfit, it can also be applied to the case of vertical misfit. However, it is in contrast to the prevalent view on overeducation, which largely starts from an economic perspective (e.g., Brunello, 2004). Overeducation is generally considered to be an overinvestment in education, implying that graduates in this situation are overqualified for their job (Verhaest & Omey, 2006). From an individual perspective, however, overeducation can still be considered to be a situation of discontinuity between education and jobs, as such (potentially) creating learning needs (e.g., Heijke et al., 2003). Consequently, it is beneficial for organisations to invest in learning possibilities for employees in a misfit condition, as they will experience a larger need to learn and thus have a higher probability to actually participate in learning activities.

Again, there is limited empirical research available testing this substituting hypothesis. The study of Heijke et al. (2003) found a positive influence on training participation when the knowledge, skills, and attitudes obtained in education did not match what is required for the job. Van Smoorenburg and van der Velden (2000) investigated the relationship between education-job fit and formal training and demonstrated that employees in a horizontal misfit situation participated more in formal training. Consequently, both Heijke et al. (2003) and Van Smoorenburg and van der Velden (2000) confirmed the substitution hypothesis for formal work-related learning activities in the case of horizontal fit. To the best of our knowledge, the substituting hypothesis was not confirmed in empirical studies focusing on vertical fit.

PRESENT STUDY

The current study aims to empirically test the contradicting explanations for the relationship between education-job fit and work-related learning of recent graduates. As mentioned before, the contradicting findings of previous research could be due to the fact that those studies demonstrate a few gaps: taking a limited perspective on the concept of education-job fit, not taking both vertical and horizontal fit (and their combinations) into account (1) and focusing on formal work-related learning, neglecting the prominent role of informal learning (2). These two gaps will be addressed in this study.

First of all, the focus is on mapping education-job fit among recent graduates and increasing understanding of how different fit situations are manifested. In contrast to most studies on education-job fit, this study takes both vertical and horizontal fit into account. Although outcomes of education-job fit are mostly investigated in relation to vertical fit, previous research demonstrated that it is essential to also consider horizontal fit when investigating outcomes of education-job fit (Sloane, 2003). Moreover, theoretically it is argued that the combinations of vertical and horizontal fit can have additional effects (Robst, 2007). Consequently, focusing on one type of fit might provide a limited understanding of its outcomes (Sloane, 2003). Moreover, a subjective measurement of fit is combined with an objective measurement of fit in order to avoid the overestimation and underestimation of fit that is common when using one measure (Leuven & Oosterbeek, 2011). By combining four measurements of fit (vertical subjective fit, vertical objective fit, horizontal subjective fit, and horizontal objective fit), this study takes a broad view on the fit situation of recent graduates. Because previous research neglected to take these different measures – and especially their combination – into account, the first research question of this study focuses on how different potential fit situations manifest across

recent graduates. Consequently, the first research question refers to the detection of education-fit profiles among recent graduates.

RQ 1. Which education-job fit profiles can be found among recent graduates?

After determining the education-fit profiles, the study aims to examine the relationship between the different education-job fit profiles and the learning behaviour of recent graduates. The *complementing* and *substituting* hypotheses are tested, assessing the impact of fit on both formal and informal learning (Kyndt & Baert, 2013). As such, it is examined whether recent graduates in different education-fit profiles report different learning behaviours on their job. As a result, the next research question is:

RQ 2a. Do participants in different fit profiles report different learning behaviour?

However, as the entrance to a new job implies additional opportunities to learn new things (Grosemans et al., 2017), we will investigate whether (possible) differences are sustained later in the job of recent graduates. As such, the complementing and substitution hypotheses are investigated in the beginning of the new job when graduates are encountering the first challenges, as well as after a period of adjustment to the job (Nicholson, 1990). Nicholson (1990) states that graduates will not experience the process of adjustment at the same pace. Accordingly, we included a time span of six months to ensure that all graduates experienced some adjustment to their job. The question here thus includes whether effects are sustained over time (either in the complementing or substitution situation) or whether the effects fade. The final research question addressed in this study thus reads as follows:

RQ 2b. Are these differences in learning behaviour sustained six months later into the job?

METHOD

PROCEDURE AND PARTICIPANTS

The data collection focused on recent graduates from different higher education institutions in Flanders (Belgium) and was part of a larger research project on the transition from higher education to the labour market. The graduates were surveyed in November 2016 (T1), approximately four months after graduation. The total sample consisted of 1459 graduates, of whom 814 indicated to be working at the time of data collection. As this study aimed to get more insight into the education-job fit, only graduates who provided details on each of the

measurements of fit were retained. Consequently, a total of 779 graduates were included in this study.

Six months after this survey, participants were asked to complete the survey again (May 2017; T2). At T2, 518 of the 779 participants completed the questionnaire. In order to gain more insight into the sustainability of the relationship, only participants who were still in the same job as indicated at T1 were retained, resulting in a sample size of 398 participants at T2 used in the analyses to answer research question 2b. Background characteristics of the sample can be found in Table 4.1.

Table 4.1. *Sample Characteristics*

	T1 (*N* = 779)	T2 - in the same job (*N* = 398)
Gender		
Male	188 (24.1%)	88 (22.1%)
Female	591 (75.9%)	310 (77.9%)
Age		
Mean	24.57	24.80
Standard Deviation	4.59	5.02
Type of contract		
Permanent	390 (50.1%)	201 (50.5%)
Temporary	388 (49.8%)	196 (49.3%)
No information	1 (0.1%)	1 (0.2%)
Working hours		
Full time	633 (81.3%)	320 (80.4%)
Part time	146 (18.7%)	78 (19.6%)
Sector		
Profit	379 (48.7%)	179 (45.0%)
Non-profit	400 (51.3%)	219 (55.0%)

INSTRUMENTS

Education-job fit. The fit between graduates' educational background (both obtained degree and study discipline) and their current job was assessed in four ways. This study takes both vertical and horizontal fit and both subjective and objective fit into account. Concerning *subjective fit*, we opted for a direct self-assessment question relating to the requirements of the job (Leuven & Oosterbeek, 2011). Vertical subjective fit was examined by asking respondents to indicate to what extent they agreed with the statement "The required level of my job matches the level of my education." Similarly, the statement for horizontal fit reads as follows: "The content of my job is in line with the content of my study discipline." Both statements were rated on a 7-point Likert scale, ranging from *totally disagree* to *totally agree*.

In addition to the subjective fit, this study took *objective fit* into account, which was assessed by means of a job analysis (Leuven & Oosterbeek, 2011). Graduates' employment was classified based on the International Standard Classification of Occupations (ISCO; International Labour Office, 2012). In order to classify their job, participants were asked to describe their current occupation, including their most important tasks. Furthermore, their educational background was classified in accordance with the International Standard Classification of Education (ISCED; UNESCO Institute for Statistics, 2012, 2014). Afterwards, both ISCO and ISCED codes were combined in order to make a correct estimation of objective fit. In the following paragraphs, these steps are explained in more detail.

For the job classification, the ISCO-08 version was used, which relies on two central concepts: skill level (including the complexity and broadness of performed tasks) and skill specialisation (including field of knowledge, tools, materials, and services) (International Labour Office, 2012). The combination of these central concepts serves as the foundation for the classification and makes it possible to classify each occupation in a group. The ISCO-08 has a hierarchical structure, which makes it possible to include the desirable level of detail in classifying jobs in major (e.g., "managers"), minor (e.g., major group "managers" consists of 11 minor groups such as "professional services managers"), or unit groups (e.g., minor group "professional services managers" consists of seven unit groups such as "child care services managers") (International Labour Office, 2012). For this study, we opted for so-called *minor groups,* which categorise all occupations in 130 groups. Based on the extensive definitions in the ISCO-08, each description was classified in a minor group by a researcher.

For the educational classification, participants were asked to indicate their educational background (i.e., obtained degree and study discipline). Their obtained degree was coded

using the ISCED-2011, in which all graduates who graduated from a bachelor's degree were classified as ISCED 6 and all graduated from a master's degree were classified as ISCED 7 (UNESCO Institute for Statistics, 2012). No other ISCED codes were used, as the study concentrated on graduates with a background in higher education. In order to classify their study discipline, the ISCED-2013-F was used. This classification distinguishes 10 broad fields of study (UNESCO Institute for Statistics, 2014).

As a final step, the ISCO and ISCED classification codes are combined, as described by the International Labour Office (2012) and by Wolbers (2003), resulting in the final objective coding of vertical and horizontal fit. Although one researcher conducted all classifications, a second researcher classified 10% of the data in order to check for potential bias. The interrater reliability was calculated by means of Cohen's Kappa and was satisfactory both for vertical objective fit (κ = .71, p < .001) and horizontal objective fit (κ = .82, p < .001; Landis & Koch, 1977).

Work-related learning. To measure work-related learning the 13-item instrument of Grosemans et al. (2018b) was used. This instrument assesses participation in formal learning activities (4 items; e.g., attending a seminar), informal learning activities using personal sources (6 items; e.g., asking feedback), and informal learning activities using environmental sources (3 items; e.g., watching visual material). All items were measured on a 7-point Likert scale, ranging from *never* to *on a daily basis*. The confirmatory factor analysis (N = 779) confirmed the structure of the instrument (CFI = .95, TLI = .94, RMSEA = .06; $\chi^2(df)$ = 220.35(62)). The three factors also demonstrated a satisfactory reliability (formal learning: α = .81; informal learning using personal sources: α = .83; informal learning using environmental sources: α = .80).

ANALYSES

In line with our research questions, analyses were performed in two steps. First of all, latent fit profiles were identified. Second, reported work-related learning activities in the different profiles were compared on the two time points.

Identifying different fit profiles. To identify fit profiles, we first explored the descriptive statistics for the incidence of fit for each of the different measures of fit. Afterwards, it was examined which fit profiles occur in practice. All four measures of fit were used simultaneously using person-centered analyses. To this end, a latent profile analysis (LPA) was chosen to capture patterns in the data (Muthen, 2001). Although the measures for objective fit are

categorical (binary) and the measures for subjective fit are Likert scales, in a LPA all four measures of fit can contribute conjointly to the identification of the subgroups.

Different models ranging from one to six profiles were compared using maximum likelihood robust estimation (MLR). Three fit indices guided the decision on the number of profiles. Two likelihood ratio tests, the Vuong-Lo-Mendell-Rubin Likelihood Ratio test (LMR) and the Bootstrap Likelihood Ratio test (BLRT) compare whether the estimated model fits the data better than a model with one profile less (Nylund, Asparouhov, & Muthen, 2007). Moreover, lower values for the Bayesian information criterion (BIC) indicate better fitting models (Nylund et al., 2007). Furthermore, in order to select the optimal model, the entropy and the theoretical meaningfulness of the profiles were taken into account as well.

Examining work-related learning in the different fit profiles. Following the identification of the profiles, differences in work-related learning were examined by means of the three-step procedure as described by Asparouhov and Muthén (2014). This approach makes it possible to identify the relationship between the latent profiles and a distal outcome (i.e., participation in work-related learning). Using the three-step approach has two main advantages compared to other techniques, such as the classic analysis of variance. On the one hand, it accounts for classification uncertainty, which is inherently associated with the use of LPA (Asparouhov & Muthén, 2014). On the other hand, this procedure makes it possible to model latent variables instead of using manifest variables. Whereas the first step comprised the estimation of the profiles and the indices are saved in a second step, the final step of the three-step procedure includes modelling the means for the outcome variable by means of a multi-indicator approach. Simultaneously, differences between these means were compared by using the Wald chi-square statistic. When the overall Wald chi-square statistic was significant, follow-up analyses (i.e., Wald chi-square for each difference separately) were conducted to detect which profiles differed.

The final research question refers to the stability of the differences in learning behaviour after six months. Consequently, the final step in the three-step procedure was repeated including the change of work-related learning from T1 to T2 for those participants who remained in the same occupation (N = 398). As this model included the measurement of work-related learning at two time points, longitudinal measurement invariance was assessed first to investigate whether participants interpreted the items and underlying structure in a similar way over the different time points (Coertjens, Donche, De Maeyer, Vanthournout, & Van Petegem, 2012). Configural, metric, and scalar invariance were achieved for the three factors of work-related learning. After

these preliminary analyses, the change between the two time points was examined by means of a latent change score model (LCSM; McArdle & Nesselroade, 2014). This model estimated the latent factors for work-related learning at T1 and T2, and then estimates a latent intercept (i.e., starting point) and a latent change score (Hertzog & Nesselroade, 2003). The LCSM was modelled in the final step of the three-step procedure (as described above) in order to estimate means of latent change scores across profiles. Again, these differences were compared using the Wald chi-square statistic.

All latent analyses were conducted using the Mplus software (version 8.1.5).

RESULTS

EDUCATION-JOB FIT PROFILES

Prior to the identification of the fit profiles, the descriptive statistics were explored to gain more insight into the incidence of fit (see Table 4.2). It is noteworthy to mention that, based on objective fit measures, the majority of graduates are employed in a job that is content-wise related to their study discipline in higher education (71.1%). In contrast, only around half of the graduates were classified as being in a job that requires their obtained degree, implying that around 50% of the sample is considered to be overeducated. Concerning subjective fit, the means of vertical and horizontal fit are both quite high, indicating that on average, graduates experienced a fit between their educational background and their job, both in terms of the degree and the study discipline.

Table 4.2. *Descriptive Statistics for Education-Job Fit Measures at T1*

	N_{fit} (N_{total} = 779)	Incidence	*M*	*SD*
Vertical objective fit	395	50.7%	-	-
Horizontal objective fit	554	71.1%	-	-
Vertical subjective fit	-	-	5.39	1.48
Horizontal subjective fit	-	-	5.38	1.53

After exploring the different measures of fit separately, the different education-job fit profiles were estimated using a LPA, ranging from one to six profiles. Based on the information criterion index (BIC), the model fit continued to improve up until six profiles (see Table 4.3). The BLRT also indicated model improvements as the number of profiles increased. The LMR, however, indicated that the six-profiles solution was not preferred over the five-profiles solution. Based on the theoretical meaningfulness of the provided profiles the solution with four profiles was identified as the most optimal solution, which was supported by the BIC value, the LMR test, and the BLRT. The entropy of the four-profiles solution was also very high, which makes it possible to clearly delineate the profiles (Celeux & Soromenho, 1996).

Table 4.3. *Goodness of Fit for the Different Models*

Number of profiles	Entropy	BIC	p-value LMR	p-value BLRT
1	-	7748.47	-	-
2	.93	7242.69	< .001	< .001
3	.88	7163.18	.023	< .001
4	.93	6989.66	< .001	< .001
5	.79	6924.26	.029	< .001
6	.83	6894.48	.11	< .001

The results for the four profiles are presented in Table 4.4. In general, the 90% confidence intervals indicate large differences between the profiles concerning subjective fit. Although differences can also be found between the profiles concerning objective fit, the latter was less distinguishing than subjective fit, especially for vertical objective fit. Taking a closer look at each profile separately indicates that graduates in the first profile are clearly typified by high scores on subjective fit for both vertical and horizontal fit. Moreover, graduates in this profile have the highest probability of being objectively classified as having a well-fitting job, both with regard to job level (i.e., vertical fit) and content of the job (i.e., horizontal fit). Therefore, this first profile is named the *full fit profile.* The second profile is also characterised by a relatively high score on horizontal subjective fit. This is also reflected in the objective measure of horizontal fit, as 70% of the graduates in this profile were classified as having a horizontal objective fit. Their vertical subjective fit is however rather low. Concerning vertical objective fit, these graduates have equal probabilities to be in a fitting or misfitting occupation. As these graduates are mainly

characterised by their high horizontal fit both subjectively and objectively, this profile is labelled the *horizontal fit profile*. In contrast to the second profile, the third profile reported a high score on vertical subjective fit and a low score on horizontal subjective fit. However, it can be noted that their probability to be classified in the vertical objective fit category is rather low (34%). Their main distinguishing feature clearly is the high score on vertical subjective fit, being the reason why this profile is referred to as the *vertical fit profile.* Graduates in the final profile indicate low scores on all four of the measures of fit. Consequently, this final profile is labelled the *full misfit profile.*

Table 4.4. *Results and 90% Confidence Intervals of the LPA with Four Profiles*

	Profile 1 *Full fit* *n* = 583	Profile 2 *Horizontal fit* *n* = 82	Profile 3 *Vertical fit* *n* = 73	Profile 4 *Full misfit* *n* = 41
Vertical objective fit	.56	.50	.34	.14
	[.52; .59]	*[.40; .60]*	*[.24; .45]*	*[.02; .25]*
Horizontal objective fit	.77	.70	.52	.23
	[.74; .80]	*[.61; .80]*	*[.42; .63]*	*[0.09; .36]*
Vertical subjective fit	6.01	2.89	5.15	1.97
	[5.95; 6.07]	*[2.68; 3.09]*	*[4.94; 5.36]*	*[1.65; 2.29]*
Horizontal subjective fit	6.02	4.92	2.96	1.72
	[5.96; 6.09]	*[4.62; 5.23]*	*[2.68; 3.25]*	*[1.41; 2.02]*

Note. Subjective fit displays the mean (and 90% confidence interval) of the profile for the measures on a 7-point Likert scale. Objective fit displays the probability (and 90% confidence interval) for each profile to be classified in the fit-condition.

RELATIONSHIP BETWEEN FIT AND WORK-RELATED LEARNING

As a next step, it was examined whether differences were found in work-related learning for these profiles. The latent means of the factors of work-related learning for each profile are shown in Table 4.5. In order to assess whether these differences were significant, the Wald chi-squared statistic was calculated for the three factors simultaneously, thus taking the interrelatedness of the aspects of work-related learning into account. This test demonstrated that differences between the profiles were meaningful (Wald $\chi^2(9) = 36.20$; $p < .001$). Follow-up

tests indicated significant differences for formal learning activities (Wald $\chi^2(3) = 20.35$; $p < .001$) and for informal learning activities using personal sources (Wald $\chi^2(3) = 15.01$; $p < .01$). The Wald-statistic ($df = 3$) equalled 5.57 for informal learning activities using environmental sources, which was not significant ($p > .05$).

For formal learning and informal learning activities using personal sources, it was explored which profiles differed. For formal learning activities, most learning behaviour was reported in the vertical fit profile, which was significantly more than that of graduates in the full misfit profile and graduates in the horizontal fit profile. Moreover, graduates in the full fit profile also indicated significantly more formal learning behaviour than graduates in the full misfit profile. Concerning informal learning activities using personal sources, reported learning behaviour was significantly higher in the full fit profile, compared to the full misfit and the vertical fit profile. Graduates in the horizontal fit profile also participated significantly more in informal learning activities using personal sources than the full misfit profile.

Table 4.5. *Means of Work-Related Learning for Different Education-Job Fit Profiles at T1*

		Profile 1 *Full fit*	Profile 2 *Horizontal fit*	Profile 3 *Vertical fit*	Profile 4 *Full misfit*	Wald Statistic					
		n = 583	*n* = 82	*n* = 73	*n* = 41	Profile 1 vs. 2	Profile 1 vs. 3	Profile 1 vs. 4	Profile 2 vs. 3	Profile 2 vs. 4	Profile 3 vs. 4
Formal learning	*M (SE)*	2.54 *(0.06)*	2.31 *(0.13)*	2.74 *(0.17)*	1.96 *(0.14)*	$p = .094$	$p = .245$	$p < .001$	$p < .05$	$p = .056$	$p < .001$
Informal learning personal sources	*M (SE)*	5.58 *(0.05)*	5.53 *(0.12)*	5.28 *(0.11)*	5.02 *(0.18)*	$p = .652$	$p < .01$	$p < .01$	$p = .122$	$p < .05$	$p = .198$
Informal learning environmental sources	*M (SE)*	4.85 *(0.06)*	4.61 *(0.17)*	4.63 *(0.17)*	4.47 *(0.25)*	-	-	-	-	-	-

Note. No differences between profiles were computed for informal learning using environmental sources, as the overall Wald statistic for this variable was not significant.

With respect to the last research question concerning the sustainability of the differences (RQ 2b), the latent change of work-related learning from T1 to T2 was modelled to investigate whether the differences between profiles remained stable. A change factor was estimated for the graduates who remained in the same occupation (and, consequently, in the same education-job fit profile; N = 398). The average change per profile for the three factors of work-related learning is presented in Table 4.6. For none of the four profiles the change factors reached significance, indicating that the average learning behaviour did not change six months later into the job. Hence, the Wald statistic did not indicate significant differences between the profiles (Wald χ^2 (9) = 4.94; $p > .05$).

Table 4.6. *Means of Change Scores of Work-Related Learning for Different Education-Job Fit Profiles*

		Profile 1 *Full fit*	Profile 2 *Horizontal fit*	Profile 3 *Vertical fit*	Profile 4 *Full misfit*
		n = 315	*n* = 30	*n* = 39	*n* = 14
Formal learning	*M (SE)*	-0.11 *(0.06)*	-0.12 *(0.45)*	0.25 *(0.35)*	-0.04 *(0.19)*
Informal learning personal sources	*M (SE)*	-0.01 *(0.07)*	0.07 *(0.24)*	0.10 *(0.20)*	-0.05 *(0.33)*
Informal learning environmental sources	*M (SE)*	-0.07 *(0.10)*	0.53 *(0.66)*	0.25 *(0.42)*	-0.64 *(0.55)*

DISCUSSION

The purpose of this study was to investigate the relationship between education-job fit and work-related learning of recent graduates. Two theoretically contradicting hypotheses on this relationship were assessed: Whereas the complementing hypothesis states that graduates experiencing education-job fit will learn more, the substituting hypothesis states that those graduates will learn less. This study addressed essential gaps in existing research on the topic by including both vertical and horizontal fit, subjective as well as objective measures and by focusing on formal as well as informal learning activities.

EDUCATION-JOB FIT PROFILES

In contrast to previous studies, this study included both the fit between the level of education and the required level for the job (i.e., vertical fit) and the fit between the study discipline and the job (i.e., horizontal fit) in order to grasp the full complexity of the connection between higher education and recent graduates' jobs (Sloane, 2003). Moreover, objective and subjective measures were combined in order to get a more nuanced view. Combining different measures tackles issues with classification uncertainty due to effects of underestimation or overestimation of fit resulting from the use of a single measure (Leuven & Oosterbeek, 2011; Robst, 2007; Verhaest & Omey, 2006).

Results of latent profile analyses indicated that most graduates (74.84%) demonstrated high levels of both vertical and horizontal fit (i.e., *full fit* profile). These graduates experience a fit between their educational background and their job, which is confirmed by the objective measures of fit. However, at the same time a non-negligible proportion of graduates (5.26%) demonstrated a *full misfit*. Given the importance of a fit between work and education in terms of career success (Groot & Maassen van den Brink, 2000; McKee-Ryan & Harvey, 2011), consequences of misfit may be substantial. Approximately equal proportions of graduates were found in a condition of solely vertical fit (9.37%) or only horizontal fit (10.53%). When looking more deeply into what distinguishes these different profiles of graduates, it was found that they mostly differed in terms of subjective fit (both vertical and horizontal). Results for objective fit measures seemed to be more ambiguous and 90% confidence intervals of the mean scores indicated some overlap between the profiles regarding objective fit. The reason for its limited distinguishing character is twofold. On the one hand, objective measures tend to underestimate the incidence of fit, implying that this measurement in itself is probably too conservative (Verhaest & Omey, 2006). On the other hand, the objective measures are coded binary (i.e., fit or misfit), whereas the subjective measures were rated on a 7-point Likert scale. As such, it is less apt to provide a nuanced view than the subjective measures. When including this measure in future research, it is thus important to combine it with other measures to verify the results. These findings demonstrate that education-job fit should not simply be reduced to *fit or misfit* but that taking different types and different measures of fit into account provides a more nuanced understanding of graduates' reality.

EDUCATION-JOB FIT AND WORK-RELATED LEARNING

When comparing the identified profiles in terms of reported participation in work-related learning, results were in favour of the *complementing* hypotheses, arguing that work-related

learning *complements* what is learned during higher education. Graduates with a full fit between their educational background and job reported more participation in both formal learning and informal learning using personal sources than graduates in a situation of full misfit (e.g., Brunello, 2004). This indicates that graduates *capitalise on a head start* for learning at work provided by a fit between their educational background and their job.

This may be problematic for graduates experiencing full misfit. Especially for these graduates, work-related learning seems to be of key importance to *fill the gap* between their educational background and the requirements of their current job. However, they were found to participate less in learning activities at work, making them at risk to get stuck in a vicious circle where their inadequate preparation for their current job hampers learning at work while exactly these learning activities may be the key to filling the gap between their educational background and job requirements. The question remains as to what the reasons are for their lower participation: Are organisations creating fewer opportunities for these graduates or are these graduates themselves not taking these opportunities, because they are for example waiting for a job opportunity that fits their educational background? As graduates in the full misfit profile are in a less favourable position, it would be important for both organisations and graduates themselves to invest in work-related learning in order to enhance their competences for their current job and *fill the gap*.

This study takes the complementing hypothesis one step further by demonstrating that different types of fit can lead to different learning behaviours. While education-job fit was found to impact formal learning activities and informal learning using personal sources; no differences were found for informal learning using environmental sources. Moreover, the different types of fit were found to differently impact formal and informal learning, demonstrating the value of taking different types of fit conjointly into account when identifying latent profiles (e.g., Verhaest et al., 2017). The findings suggest that while especially *vertical* fit is influential for fostering participation in *formal* learning, *horizontal* education-job fit matters most for stimulating informal learning activities. As such, results for *formal* work-related learning (such as trainings and seminars) demonstrated that graduates experiencing *vertical* fit reported significantly higher scores than those in a horizontal fit or full misfit condition. Given that organisations are generally assumed to have a stronger impact on decisions regarding participation in formal learning while participation in informal learning activities is more strongly steered by the employee (Kyndt & Baert, 2013), these results suggest that organisations tend to invest more in graduates who are working at their level of education, in line with the presumption in human capital theory (van Eijs & Heijke, 2000).

In contrast, more participation in *informal* work-related learning activities using personal resources was reported by graduates in the *horizontal* fit profile than by graduates in a situation of full misfit. Furthermore, graduates in the full fit profile reported more informal learning than graduates demonstrating only vertical fit, again indicating that horizontal fit is key for stimulating informal learning. Hence, graduates who are working in a job in line with their study domain appeared to participate more in informal learning activities such as asking feedback, observing colleagues, and reflecting. Thus, graduates who are more familiar with the domain they are working in made more use of available personal resources. This suggests that when the study domain during higher education is aligned with their job, this domain functions as a necessary foundation to continue to learn at work. This is in line with the statement of Teichler (2007) that "higher education has a qualifying function for the world of work" (p. 16).

When looking at whether these differences where sustained over time, latent change scores demonstrated that reported work-related learning behaviour remained unchanged. The differences between the profiles in work-related learning that existed in the first months in the job continued to exist six months later when graduates are expected to be adjusting to the job (Nicholson, 1990). Hence, the complementing hypothesis remained dominant over the substituting hypothesis, even after approximately one year after graduation when most graduates could be expected to be already in the adjustment stage.

LIMITATIONS AND DIRECTIONS FOR FUTURE RESEARCH

Despite the insights derived from this study and its contributions, it is important to also keep its limitations in mind when interpreting the results.

First of all, although education-job fit as conceptualised and operationalised in this study has proven to be useful to examine the connection between higher education and the job (Grosemans et al., 2017), it also has limitations. As such, it assumes that the group of graduates with the same degree is more or less homogeneous. However, individual-level differences among graduates within this structure are inevitably present as not all graduates with the same degree can be expected to have developed exactly the same competences (Heijke et al., 2003). Hence, it would be interesting for future research to focus on the fit between the developed competences of recent graduates and the required competences for the job. As such, research would be able to get additional information on the heterogeneity and individual-level differences among graduates that are still present in the identified profiles in this study (Green & McIntosh, 2007). Taking this heterogeneity into account could possibly reveal additional differences in work-related learning. This could provide key input for the career

guidance and counselling for students and graduates and provide insights for custom-made and individualised support trajectories, both in finding a job with an appropriate fit and in supporting work-related learning after the transition to the labour market.

Second, specific characteristics of the sample under investigation – in terms of educational level and geographic location – necessitate caution when generalising the findings to other educational levels or other types of labour markets. As the sample focused on graduates with a background in higher education, it is important to note that the results on vertical fit might be different when examining graduates without a higher education degree (Verhaest & Omey, 2006). Whereas no explicit distinction was made between over- and undereducation, graduates with a vertical misfit in the present study are overeducated: In the objective measures of vertical fit higher education is the highest level, implying that undereducation cannot exist for these graduates (UNESCO Institute for Statistics, 2012). It would be interesting to analyse a more diversified sample for vertical fit in order to get more insight in the possible differences for graduates who are over- and undereducated. Furthermore, this study focused solely on graduates in Flanders (Belgium). Prior research has demonstrated that effects related to education-job fit depend on the county in which the study is conducted (Verhaest et al., 2017). Different results were detected when investigating education-job fit and its effects, depending on both the vocational specificity of the educational system (i.e., the focus on a general or specific preparation for work) and labour market effects (e.g., availability of jobs; Wolbers, 2003). Although the situation in Belgium (both educational system and labour market) shows many similarities with other Western countries, it would be interesting to replicate these results in countries with a different educational system and/or with a different economic labour market situation.

Finally, this study focused on the first period in the job (i.e., encounter and adjustment stage). While sustained differences over time were identified, it would be valuable to take a larger time span into account by also including measurement moments later in employees' career. Taking a larger time span into account would be interesting to identify whether graduates subjectively remained in the same profile or changed profiles. As job crafting is increasingly important nowadays, one could argue that graduates will try to make adjustments in their jobs in order to make their job match their background after stabilisation in the job (e.g., Renn & Hodges, 2007). Education-job fit should not be considered a permanent state when the content of employees' job shifts (Leuven & Oosterbeek, 2011). Concerning its relationship with work-related learning, it would also be interesting to include additional time points in a longitudinal design: Taking a transition perspective, it is known that graduates will need time to stabilise into

their job after the adjustment stage (Nicholson, 1990). Recent graduates will learn more than their more experienced colleagues (Lowe & Krahn, 1995). Consequently, it would be interesting to see how their work-related learning behaviour develops during (the following stages in) their career and whether changes can be detected in this development across employees in different fit profiles.

CONCLUSION AND CONTRIBUTIONS

In conclusion, this study made both theoretical and methodological contributions to research on the relationship between education-job fit and work-related learning. The combination of different types and measures of fit in latent profile analyses demonstrated that different combinations of vertical and horizontal fit can manifest across individuals. An important theoretical contribution of this study results from the juxtaposition of two theoretically opposing hypotheses concerning the relationship between education-job fit and work-related learning (complementing and substituting). This study provided support for the complementing hypothesis, arguing that continued learning at work complements what was learned during higher education. Moreover, this study refined theorising on this relationship by demonstrating how different types of fit combinations differently influence formal and informal learning activities. A refined fit concept (vertical and horizontal, objective and subjective measures) as well as an integrative understanding of work-related learning (looking at both formal and informal learning activities) were combined in the investigation of the relationship between education-job fit and learning at work. As such, while the level of education (i.e., vertical fit) mattered for formal learning, results indicate that especially horizontal fit in terms of alignment of one's job and one's study domain was of importance for informal learning activities using personal sources. Moreover, the relationship between education-job fit and work-related learning was found to remain the same during the first months into the job, when graduates are expected to be adjusting to their job.

General Discussion



FUTURE-PROOF

In this dissertation we focused on work-related learning in the transition from higher education to work. Although all employees will need to engage in learning at work throughout their careers, the largest need is felt among recent graduates: The new working context provides numerous opportunities to engage in work-related learning, and graduates will need to cope with the challenges of their new job (Brooks & Everett, 2008). Additional to this need, the benefits of work-related learning might be larger for recent graduates, as work-related learning will lead to the accumulation of personal resources, which will function as a basis to engage in subsequent work-related learning (Hobfoll, Halbesleben, Neveu, & Westman, 2018; Kyndt, Endedijk, & Beausaert, 2018). Hence, work-related learning is demonstrated to be important for recent graduates, and higher education is expected to make its students future-proof by preparing them to continue to learn at work (Teichler, 2007). Despite the importance of work-related learning for recent graduates, prior research devoted little attention to work-related learning in the beginning of graduates' careers. Therefore, this dissertation aimed to address this gap by increasing the understanding of work-related learning in the transition to work (objective 1), and investigating factors within the transition that can facilitate this work-related learning (objective 2).

This dissertation took the complexity of the transition (Teichler, 1999) into account when examining the role of work-related learning. We started following students within their final year of higher education, as the transition is generally considered as a process that already starts in higher education (Arnett, 2000; Forrier, Sels, & Stynen, 2009; Nicholson, 1990). In line with different models on transitions, this dissertation acknowledged the importance of assigning an active and central role to individuals and including contextual factors when investigating (outcomes of) the transition process (e.g., Arnett, 2000; Forrier et al. 2009; Nicholson, 1990).

In the subsequent sections, the key findings of this dissertation will be presented and discussed. Furthermore, we highlight the main strengths and limitations. Finally, directions for future research and implications for practice are suggested.

SUMMARY OF KEY FINDINGS

OBJECTIVE 1. INCREASE THE UNDERSTANDING OF THE NATURE OF WORK-RELATED LEARNING OF RECENT GRADUATES

The first objective of this dissertation focused on increasing our understanding of work-related learning in the transition from higher education to work. An important step to this end was to bring existing literature on this topic together in a systematic review study (i.e., Chapter 1). Three aspects of (work-related) learning in the transition were investigated: the developed competences before the entrance to the labour market, the process of transferring these competences, and the role of learning at work.

A first aspect refers to graduates' competences (being knowledge, skills, and/or attitudes): They enter the labour market with a set of competences, which can serve as a foundation to engage in work-related learning. This aspect is key in the on-going debate on whether higher education should provide its students with generic or specific competences (Teichler, 2007): Does higher education need to function as a broad preparation (i.e., generic competences) or does higher education need to give a specific preparation (i.e., specific competences) (Heijke, Meng, & Ris, 2003)? In the first chapter, we brought all literature on this topic together and clustered the competences that were addressed in prior research. The results of this study indicated that graduates, employers, and educators expect a *broad range of competences* to be developed by recent graduates when they enter the labour market (e.g., Evers & Rush, 1996; Lowe & Krahn, 1995). In general, mostly *generic competences* were emphasised by all stakeholders. More specifically, graduates put a strong focus on personal competences (being competences related to personal effectiveness and development) (Biesma, Pavlova, van Merode, & Groot, 2007; Young & Chapman, 2010), whereas employers mainly deemed people competences important (being competences that are related to interaction with others) (Evers & Rush, 1996). The competences that were most often indicated as being necessary by graduates, employers, and educators are: theoretical knowledge, problem-solving, communication, and lifelong learning skills. Hence, the results of Chapter 1 suggest that higher education should provide its students with competences that are a *foundation* for subsequent professional development.

To use these competences in the workplace as a foundation for subsequent work-related learning, graduates will need to transfer their competences, developed within higher education, to their working environment (Le Maistre & Paré, 2004). Chapter 1 indicated that the degree to

which graduates experience this transfer as smooth varies. Three main processes were reported in the primary studies: continuity, detailing, and discontinuity. Graduates in a *continuity* situation feel that their working environment directly builds on their existing set of competences – in contrast to those in the *discontinuity* situation, who feel that there is hardly any overlap between their competences and the required competences at work (Abrandt Dahlgren, Hult, Dahlgren, Hård af Segerstad, & Johansson, 2006; Nilsson, 2010). The final group of graduates indicates that they need to deepen their competences: Their competences are not directly applicable to the workplace and they need to go through a process of *detailing,* in which they need to build on the developed competences in order to make them useful in the workplace (Abrandt Dahlgren et al., 2006; Nilsson, 2010).

Regardless of how graduates experience their transition process, all graduates will need to engage in work-related learning to gain additional knowledge, skills, or attitudes – although the intensity of their work-related learning behaviour will vary (Le Maistre & Paré, 2004). The results of Chapter 1 indicated that graduates do expect to develop additional knowledge, skills, and attitudes at work and that they do participate in work-related learning activities, already at the very start of their new job (e.g., Lowe & Krahn, 1995). Concerning the learning outcomes of this learning behaviour, they expect it to *exceed what they already know*: Graduates consider work-related learning to be crucial, especially to learn these things that are impossible to learn within higher education because of the specificities in the workplace (e.g., Yan et al., 2013).

OBJECTIVE 2. INVESTIGATE HOW FACTORS WITHIN THE TRANSITION TO WORK FACILITATE WORK-RELATED LEARNING

As a second objective, we aimed to get more insight in how students can be prepared to continue to learn, which is crucial in the current society characterised by extensive changes – in other words: how students can become *future-proof*. More specifically, we aimed to investigate the relationship between factors within the transition and work-related learning by focusing on (the development of) personal factors (i.e., objective 2a) and education-job fit (i.e., objective 2b). To this end, we first developed an instrument to measure participation in work-related learning activities. The development and validation of the instrument to measure work-related learning revealed three distinct factors: formal learning activities, informal learning activities using personal sources, and informal learning activities using environmental sources. *Formal learning activities* cluster those activities that mostly have clear goals and are organised on beforehand, mostly by someone else (e.g., Eraut, 2000). Examples are attending presentations, conferences, or seminars. The other remaining activities are informal in nature: They are often

embedded in daily work activities (e.g., Lohman, 2006). Two factors were found which differ in the source used in the activities. *Informal learning activities using personal sources* are activities in which graduates learn by themselves or from interaction with others, such as reflection, observation, or a discussion with others (such as colleagues or a supervisor). *Informal learning activities using environmental sources* are those activities in which external sources are used. Examples are watching videos, reading, or searching for information. Hence, this dissertation contributed to existing literature on work-related learning by integrating a wide range of learning activities simultaneously, illustrating the multidimensionality of work-related learning. Moreover, the instrument is applicable to all employees, regardless of their specific job. This makes it possible to use the instrument throughout employees' careers. In sum, the developed instrument was demonstrated to be valid and reliable and thus functions as a good starting point to further investigate how factors relate to work-related learning.

Objective 2A. Grasp the influence of personal factors on work-related learning. This dissertation took the traditional literature on the transition to work one step further by empirically investigating the transition as a process that already starts in higher education (Arnett, 2000; Forrier et al., 2009; Nicholson, 1990). Taking this process-approach, personal factors have the potential to be transferred from one context to another. We focused on self-efficacy and achievement goals, as they are consistently shown to be strong predictors of work-related learning in general (e.g., Kyndt & Baert, 2013), and they are essential factors in transition processes (e.g., Akkermans, Nykänen, & Vuori, 2015). In Chapter 3, the development patterns of self-efficacy and three achievement goals (i.e., learning-goal, performance-approach, and performance-avoidance) were estimated. The results demonstrated linear and positive trajectories for self-efficacy and learning-goal orientation, and a linear negative trajectory for performance-avoidance orientation. Hence, this dissertation empirically demonstrated that self-efficacy and these achievement goals are (linearly) transferred from the educational context to the working context. For performance-approach orientation, a free time scores model was retained, which demonstrated that 95% of the change occurred between graduation and four months after graduation. This result can be explained by the fact that a large percentage of graduates with a background in higher education are working in competitive environments, which is generally more performance-oriented than learning-oriented (Tomlinson, 2012).

Whereas prior research often focused on separate effects of self-efficacy or achievement goals, this dissertation accounted for the conjoint effects of self-efficacy and achievement goals. The different growth trajectories were combined to identify motivational profiles. The latent class

growth analysis determined four distinct profiles, which mainly demonstrated differences in their intercepts. Graduates in the *strongly efficacious and approach-oriented profile* reported high (and increasing) scores on self-efficacy and both learning-goal and performance-orientation. Graduates in the *moderate efficacious and approach-oriented profile* showed similar growth trajectories, but had moderate starting values. The third profile, *moderate efficacious and learning-oriented profile* clustered graduates with an increase (but moderate starting value) for self-efficacy, with a stable learning-goal orientation. These graduates had low starting values for performance-approach orientation. Finally, the *undecided motivational profile* demonstrated a constantly low learning-goal orientation and a constantly high performance-avoidance orientation. These results demonstrate that qualitatively different subpopulations can be identified.

Finally, the influence of the development of self-efficacy and achievement goals on work-related learning was investigated by examining differences in work-related learning between the motivational profiles. The results showed that graduates in the *strongly efficacious and approach-oriented profile* reported most participation in formal and informal learning activities using personal sources. Graduates in the *undecided motivational profile* participated less in informal learning activities using personal sources than graduates in both the *strongly efficacious and approach-oriented profile* and the *moderate efficacious and learning-oriented profile*. Consequently, the third chapter demonstrated that differences in (the development of) self-efficacy and achievement goals are related to differences in work-related learning behaviour in the transition to work.

Objective 2B. Examine the relationship between education-job fit and work-related learning. Whereas the prior objective aimed to get more insight in the relationship between personal factors and work-related learning in the transition to work, this objective focused on contextual factors. A crucial contextual factor in the transition to work relates to the degree to which graduates' jobs are aligned with their educational background, being their education-job fit (Heijke et al., 2003). The first chapter explored the education-job fit of recent graduates by mapping the incidence of (different types of) fit in prior research on the transition from higher education to work. The results demonstrated that four types of fit were investigated in previous research. *Vertical fit* refers to the degree to which the level of graduates' education corresponds with the required level for their job (Heijke et al. 2003). *Horizontal fit* includes the match between the study discipline and the domain of the job (Verhaest & Omey, 2003). A fit between the developed competences in education and the required competences in the job is labelled as *competence fit* (Nicolescu & Păun, 2009). Finally, *person-environment fit* is studied,

being the fit between the values and interests of the person and the values and interests that are aspired in the organisation (Sung et al., 2011).

When aiming to investigate the role of education-job fit in work-related learning in general, the value of person-environment fit is rather low: This type of fit is considered to be tied to the person, independent of the educational background (Sung et al., 2011). Therefore, the fourth chapter focused on both vertical and horizontal fit in relation to work-related learning. Despite its value, this study did not take competence fit into account, as our goal was to get insight in general processes for a large group of graduates while competence fit gives a very specific view and is not suitable to examine in a heterogeneous group of students. The two types of fit were measured in a subjective way (i.e., self-assessment) and in an objective way (i.e., job analysis) (Leuven & Oosterbeek, 2011). Consequently, four measures of fit were included in this study (vertical objective fit, vertical subjective fit, horizontal objective fit, and horizontal subjective fit) in order to provide a more accurate view than prior studies on education-job fit as this accounts for under- or overestimation of the separate measures (Verhaest et al., 2017). Using a latent profile analysis, we identified four fit profiles: *full fit*, *full misfit*, *vertical fit*, and *horizontal fit*.

In a subsequent step, we investigated whether differences could be detected in work-related learning across the different profiles. Theoretically, two contradicting processes were proposed. On the one hand research suggested that work-related learning could *complement* what was learned within education: Graduates who experience fit would learn more, because they can build on their existing knowledge, skills, and attitudes (Brunello, 2004). On the other hand, work-related learning could function as a *substitute*: Graduates who experience a misfit would learn more, because they need to fill a gap in their existing knowledge, skills, and attitudes (Heijke et al., 2003). The results support the complementing hypothesis: Graduates in the *full fit profile* reported more work-related learning behaviour than graduates in the *full misfit profile*. Moreover, it was demonstrated that the alignment at level of education (i.e., vertical fit) was of importance for formal learning activities and that alignment at domain level (i.e., horizontal fit) mattered for informal learning using personal sources. Furthermore, these differences were sustained six months later in the job, indicating that this effect is not only an artefact of the switching of contexts but continues to exist six months later, when graduates are supposed to have experienced a period of adjustment to their job.

STRENGTHS

Additional to the discussion of the key findings for each objective separately, we want to highlight four main strengths of this dissertation, based on the integrated findings of the different studies.

BRIDGING TWO WORLDS

The transition to work is a topic with high relevance, which is reflected in ample research investigating this period (Teichler, 2007). Both in theory and in practice, it is often stated that higher education should prepare its students for the transition to work (Lindberg, 2010; Nilsson, 2010), implying that what happens within higher education influences what happens after graduation (e.g., Nicholson, 1990). While this assumption is the starting point of research on the transition to work, when taking a closer look at the studies that are focusing on the transition from higher education to work, it should be noted that most of these studies are focusing on either the period within higher education or the period after graduation (Grosemans & Kyndt, 2017). This became clear by concentrating on the measurement moments of the primary studies in our systematic review (Chapter 1): The number of studies that used a longitudinal design collecting data across the transition was rather low. Research that empirically investigates the assumption that higher education prepares graduates for the transition is thus scarce. A main strength of this doctoral dissertation is that it empirically focused on the transition as the dynamic process of change from one context (i.e., higher education) to another context (i.e., the labour market).

Bridging the two contexts (education and work) in research is the most valid way to contribute to true understanding of the transition to work: Taking both contexts into account is the only way to unravel processes that occur during the transition period. Making the connection between both contexts has methodological implications as it implies that research adopts a longitudinal design with measurement moments both in higher education and after graduation (Coertjens, Donche, De Maeyer, Vanthournout, & Van Petegem, 2012). As the transition to work is a period characterised by extensive changes for individuals (Kowtha, 2011), it is crucial to assess whether scales and items are interpreted in the same way across the different measurement moments (Coertjens et al., 2012). This can be done by assessing longitudinal measurement invariance of the scales, which was done in all empirical studies in this dissertation. As longitudinal measurement invariance was demonstrated for the variables that

were used at more than one measurement moment, it became possible to approach the transition as a dynamic process and draw conclusions on the change over time.

The detection of change in personal factors during the transition to work – for example in terms of self-efficacy and achievement goals (Chapter 3) – can contribute to theory-building on the transition to work. As stated in the general introduction of this dissertation, currently a unified theoretical framework on the transition to work is non-existent. By connecting the world of higher education and the world of work, we were able to provide a starting point for theory-building on the topic: It allowed us to conclude that the transition to work is a process in which personal factors can be transferred from the educational context to the working context. This process of transfer of personal factors is thus important to include when developing a theoretical framework on the transition to work.

FOCUSING ON INDIVIDUAL DIFFERENCES

By approaching the transition as a process, we aimed to get more insight in general processes occurring in the transition to work. However, due to the extensive changes for graduates, it has to be acknowledged that not all graduates experience the transition similarly – experiences can vary across graduates (Arnett, 2004). Therefore, these individual differences were accounted for by means of a person-centered approach, being a latent class growth analysis (Chapter 3) and a latent profile analysis combining categorical and continuous variables (Chapter 4). These techniques identify qualitative different subgroups within the data by clustering individuals who are demonstrating similar patterns (Jung & Wickrama, 2008). Whereas using a variable-centered approach describes the effects of relations between variables for the entire population, a person-centered approach has the potential to grasp an unobserved heterogeneity and can thus capture individual differences between graduates within the transition to work (Wickrama, Lee, O'Neal, & Lorenz, 2016).

In Chapter 3, we detected four distinct motivational profiles, describing growth trajectories of self-efficacy and the three achievement goals. In Chapter 4, we were able to identify four distinct fit profiles, referring to graduates' vertical and horizontal education-job fit, measured both objectively and subjectively. Hence, these two studies acknowledged and confirmed the existence of individual differences between graduates. The key value of such a person-centered approach lies in the fact that they have the potential to provide a deeper understanding of the relation with certain outcome variables (in this case: work-related learning) (Hickendorff, Edelsbrunner, McMullen, Schneider, & Trezise, 2018). Relating the identified profiles to work-related learning behaviour provides opportunities to identify those

students/graduates who are 'at risk' concerning learning behaviour (i.e., *undecided motivational profile* or *full misfit profile*). The detection of the profiles can thus serve as a starting point to identify those graduates and subsequently support them in their working environment or already within higher education by means of career counselling. As such, focusing on individual differences can be considered to be a strength of this dissertation, as we were able to take the rich variability between graduates into account when investigating the relationship between variables (Hickendorff et al., 2018).

INTEGRATIVE UNDERSTANDING OF WORK-RELATED LEARNING

A third strength lies in the way in which work-related learning as an outcome in the transition process was investigated. The importance of work-related learning for early-career employees was already stressed within prior research (Brooks & Everett, 2008). A limited number of studies also investigated work-related learning in the beginning of employees' careers, but work-related learning was usually interpreted in a narrow way (e.g., De Witte, Verhofstadt, & Omey, 2007), often by focusing solely on formal learning activities. This dissertation tackled this issue by constructing and validating an integrative instrument measuring work-related learning that considers a wide range of learning activities (i.e., formal learning activities, informal learning activities using personal sources, and informal learning activities using environmental sources). As the instrument was validated in a heterogeneous sample (regarding experience and occupations), the instrument is suitable for all career stages; and can be used to examine work-related learning throughout employees' careers. Using this instrument made it possible to detect whether certain personal and contextual factors affect these learning activities differently.

Both Chapters 3 and 4 demonstrated the value of focusing on those different learning activities: In these chapters, we identified profiles and investigated whether differences could be found regarding their participation in work-related learning. In both chapters, we found that differences in work-related learning between profiles were dependent on the type of learning activities. Hence, by including a wide range of learning activities, it was possible to get more insight in the (different) underlying mechanisms. It should be noted, however, that no differences between profiles were detected for informal learning using environmental sources. This means that neither motivational profiles of graduates nor fit profiles explained differences in this type of learning behaviour (despite the high variance that was present in this variable). A possible explanation is that most differences in informal learning activities using environmental sources would be explained by the specific type of job, compared to personal sources. For some employees the use of these environmental sources (books, journals, videos) is more

embedded in their job than for others. For example, when comparing researchers to nurses, it can be expected that researchers will more often make use of environmental sources; whereas reading or watching videos is not inherently part of the job of nurses. The degree to which environmental sources are embedded in employees' daily practice might thus have a larger explanatory value than the motivational profile of fit profile of employees. In sum, this dissertation demonstrated that investigating work-related learning in an integrative way provides opportunities to disentangle differences in work-related learning between recent graduates.

THE ROLE OF HIGHER EDUCATION

A final strength we want to outline relates to the role of higher education in the transition to work. Taking the results of the different chapters together leads to the conclusion that higher education serves as a *foundation* during the transition to work – on the level of competences, personal factors, and the alignment with the job (i.e., education-job fit). The first chapter has demonstrated that mainly generic competences are stressed as being necessary for students to develop in higher education, including skills for lifelong learning. Put differently, higher education needs to provide its students with a broad and solid foundation in order to give them the opportunities to build on it once they start working. The third chapter showed that the foundations laid in higher education, concerning self-efficacy and achievement goals, had effects on work-related learning after graduation. In line, the fourth chapter proved that a stronger alignment between graduates' educational background and their job (in terms of vertical and horizontal education-job fit) led to more participation in work-related learning activities. Integrating findings from this dissertation, we can conclude that higher education has a pivotal role for subsequent work-related learning. Moreover, its preparatory role goes beyond the classical view of a content-related preparation (Teichler, 2007). The dissertation demonstrated that higher education can also contribute to a strong foundation concerning personal factors and alignment with the future job. As such, this dissertation contributed by taking a broader perspective on how higher education can prepare its students to become future-proof, shedding more light on its importance within the challenging period of the transition to work.

LIMITATIONS

Despite the strengths of the studies, it has to be acknowledged that this dissertation comes with certain limitations. Every chapter outlined its specific concerns, here we will elaborate on four main limitations of the dissertation as a whole.

THE USE OF SELF-REPORT

The dissertation used a quantitative longitudinal design to answer the different proposed research questions in which questionnaires were administered to students/graduates. This implies that all measures used in the empirical studies (Chapter 2, 3, and 4) rely on self-reported estimates of those individuals, which potentially creates a self-reported bias (Spector, 1994). Although research has demonstrated that subjective self-reported measures are specifically sensitive to systematic biases (i.e., individuals tending to over- or underestimate themselves) (Podsakoff, MacKenzie, Lee, Podsakoff, 2003), it can also be argued that behaviour is guided by individuals' perception of reality. As such, self-reported measures are considered a sensible way to measure self-efficacy and achievement goals, as individuals themselves have most insight in their true motivation (Spector, 1994). We tried to limit the potential negative effects of self-reported measures by including a more objective measure of education-job fit in Chapter 4. For work-related learning, however, it would be valuable for future research to combine this self-reported measure with a measurement rating learning behaviour by relevant others, such as colleagues or supervisors (Simmering, Colquitt, Noe, & Porter, 2003).

MISSINGNESS

A second limitation refers to a common problem in longitudinal research: Not every individual participated at each measurement moment, despite the effort that was put into motivating participants to fill out the questionnaires. Missing data techniques were used to cope with this problem. We used full-information maximum likelihood to make an accurate estimate of the data that were missing, as this was demonstrated to be preferable to listwise deletion when data are not missing completely at random (Allison, 2003; Enders & Bandalos, 2001). As a fair number of participants completed most waves of data collection, the sample was large enough to apply this technique and draw reliable conclusions on the empirical studies (Allison, 2003). In line with this reasoning, participants were invited to fill out the questionnaires at each wave of data collection, also when they did not participate in all previous waves in order to obtain as

much information as possible, leading to more accurate estimations of their missing data points by using the missing data techniques.

SOLE FOCUS ON EMPLOYMENT AT WAVE 4

In this dissertation, we focused on learning at work. This focus implied that in Chapters 3 and 4 we only used data of those graduates who had found work before the fourth wave of data collection. Two remarks have to be made concerning this point. First, the selected time point can be considered arbitrary: We used November as a cut-off point, implying that graduates who were employed in December were not included in the study. There is no literature that clearly indicates the best moment to investigate recent graduates, although research has indicated that probabilities of joblessness for higher education graduates in Flanders are rather low after four to six months (Vanoverberghe, Verhaest, Verhofstadt, & Omey, 2008). Second, as not every participant filled out the questionnaire at this measurement moment, we needed to make a strong selection within our data: We only included data of those graduates who indicated they were working by the fourth wave, implying that we could not use all available data (as we did not have information on the employment status of a certain group of participants). However, using this approach guaranteed that we only used those graduates who were the focus of the studies and could provide useful information to answer our research questions.

GENERALISABILITY OF FINDINGS

A final limitation we want to highlight concerns the generalisability of the findings in this dissertation. When interpreting the findings, three characteristics of the graduates should be kept in mind: their employment status, their educational background, and the country in which the data are collected. First, and in line with the previous described limitation, this dissertation focused on recent graduates who obtained *employment* four months after graduation. Although most graduates are in this case (e.g. Vanoverberghe et al., 2008), a number of graduates are still looking for a job. The findings of this dissertation cannot be generalised to all graduates making the leap, as we did not investigate graduates who were not employed yet. Second, we only included graduates with a background in *higher education*. We did include graduates from all study disciplines and graduates from university and university colleges, contributing to the generalisability of our results within higher education. However, the findings should not be generalised to graduates without a background in higher education, as the level of education is demonstrated to be important both for work-related learning (e.g., Booth, 1991) and the transition to work (e.g., Giret, 2011). Finally, the data were collected in *Flanders,*

Belgium, which could pose questions concerning the degree to which the findings can be generalised to graduates in other countries. As stated by Syed and Mitchell (2013), experiences widely vary within this transition period depending on the country. Nevertheless, it is expected that the experienced challenges for graduates within most Western countries are comparable (Syed & Mitchell, 2013).

DIRECTIONS FOR FUTURE RESEARCH

The studies in this dissertation contributed to our understanding of work-related learning within the transition to work. We were able to explore how personal and contextual factors relate to this work-related learning and as such this dissertation has the potential to enhance the research in the field. Below, avenues for future research are outlined that complement he results of the studies.

EXPLAINING INDIVIDUAL DIFFERENCES

Within this dissertation, we mapped individual differences (by identifying different profiles) and related this to an outcome (i.e., work-related learning) both in Chapter 3 and 4. However, it would be interesting for future research to concentrate on *why* these individual differences came about. It would be valuable to unravel the effects of different (career-related) activities: Prior research has argued that engagement in *extra-curricular activities,* such as job fairs or courses to improve their CV, enhances the degree to which graduates feel prepared to enter the labour market (Evers & Rush, 1996). Participation in these activities might lead to an increased motivation or a higher probability to get an optimal fit (e.g., Lindberg, 2010; Passaretti & Triventi, 2015). Therefore, future research could examine whether participation in extra-curricular career-related activities fosters students' motivation or whether it increases their probability to find a job with optimal alignment with their education background.

However, a sole focus on these extra-curricular activities does not suffice to capture how activities during the period within higher education can influence the classification of graduates into the different profiles, as education programmes might also include activities to enhance career development in their curriculum. Therefore, future research should also focus on activities embedded in the curriculum to capture the role of higher education: Which elements in the *curriculum* have an effect on the classification of individuals into different profiles? It is expected that mainly those activities that concentrate on gaining *experiences with professional practice* have the potential to increase graduates' motivation or the probability to get an optimal

education-job fit (Edvardsson Stiwne & Jungert, 2010). As a follow-up question, future research could examine which of the possible activities (e.g., internship, problem-based education, practice-oriented thesis, reflection on work values) is the most effective for final-year students.

In relation to work-related learning, a subsequent step would be to focus on a smaller and specific group, for example by focusing on graduates from one study discipline (e.g., Bridgstock, 2011; Yan, Gao, & Lam, 2013). Although focusing on one study discipline has limitations (mainly because of the reduction of variance compared to the diversified group), it provides the opportunity to get a more detailed view on work-related learning. By focusing on one study discipline, research would be able to map the competences that are developed within higher education and how they are aligned with the competences necessary to perform their job (i.e., competence fit) (e.g., Lindberg, 2010). As such, research would be able to investigate which competences are improved or acquired by means of work-related learning. Furthermore, future research could investigate how personal and contextual factors (i.e., as antecedents) lead to work-related learning (i.e., as learning behaviour) and consequently to competence development (i.e., as learning outcomes). As such, it would be possible to unravel whether antecedents have different effects for varying learning outcomes.

CAREER-RELATED PERSONAL FACTORS IN THE TRANSITION PROCESS

When aiming to understand the transition from higher education to work, it is crucial to unravel the effects of the interaction between factors within higher education and in the working context. This dissertation provided a first step in increasing the understanding of the transition process by investigating how personal factors could be transferred to the working context. Although differences in work-related learning were found between motivational profiles, the effect sizes were small. Consequently, it would be interesting to replicate the results using other factors bridging education and work. An interesting avenue for future research is to concentrate on how career-related personal factors develop during higher education and how these factors are transferred to the working environment. For example, it is interesting to focus on the development and transfer of students' career competences, being those competences central to career development, such as networking or work exploration (Akkermans et al., 2015). Prior research demonstrated that career competences are inevitable for all employees and stressed the role of higher education to develop career competences (Kuijpers & Meijers, 2012), indicating its relevance in the transition to work. By focusing on career-related personal factors within higher education, future research would contribute to enhanced insights in the connection between higher education and the labour market.

TAKING A CAREER PERSPECTIVE

A final suggestion for future research is to adopt a career perspective. To adopt this broader perspective, two pathways are put forward: including a wider time span and focusing on additional career-related outcomes. Concerning the time span, we focused on the very start of graduates' career and included the first year in their job. Prior research did however argue that the transition to work can have long-lasting effects (e.g., Baert, Cockx, & Verhaest, 2013). Although it remains important to take these first months into account when aiming to draw conclusions on the transition to work, the subsequent years are of interest as well (Finnie, 2004). A second pathway for future research relates to the inclusion of multiple outcomes. Despite the undeniable importance of work-related learning in the current society, work-related learning is not the sole important outcome of the transition to work. De Vos, Dujardin, Gielens, and Meyers (2016) stress the importance of building a sustainable career, also in the case of career starters. Sustainable careers rely on individuals' "ability to adjust, develop and fit in an ever-changing environment" (De Vos et al., 2016, p. 9). Employees are not able to perform constantly in every situation, stressing the importance of the balance between the different domains in employees' lives. This encompasses that individuals have a good understanding of what is important to them (De Vos et al., 2016). Although work-related learning plays a central role within a sustainable career, future research should focus on other aspects (such as work-life balance and work values) of sustainable careers and the role of higher education in facilitating them.

IMPLICATIONS FOR PRACTICE

Besides the contributions for research, the findings within this dissertation suggest a number of implications for practice. Below, we will outline suggestions for higher education, suggestions for organisations employing recent graduates, and suggestions for individuals in the transition to work in order to become and remain future-proof.

SUGGESTIONS FOR HIGHER EDUCATION

The role of higher education in the transition has been much debated (Teichler, 2007). Numerous opinions have been expressed regarding the competences that higher education should focus on (Teichler, 2007). These inordinate expectations vary from providing students with broad and versatile competences to state-of-the-art technical competences, making it almost impossible to design a curriculum. Building on the findings of Chapter 1, which integrated the primary studies – stressing the importance of generic competences – higher

education should provide its students with these generic competences, which can serve as a basis to continue learning later in their jobs. Based on the conclusions of the systematic review study, higher education can prepare their students to become future-proof learners by designing a curriculum that includes development of the necessary theoretical knowledge (as a foundation for other specific competences), communication, problem-solving, and lifelong learning skills.

Focus on competences that can lay a foundation for graduates

Graduates will continue to grow after higher education, so it is crucial that higher education explicitly takes a role in preparing its students to become *future-proof learners*. Being future-proof learners includes that graduates engage in work-related learning and as such continue to be able to perform in their job, but also that they focus on their career and remain employable. The integrated findings of the dissertation point towards the fact that higher education should lay the *foundation* for the transition to work and eventually for their career. Therefore, we consider it to be important for higher education to take a broad focus on fostering graduates' careers. Chapter 1 revealed that graduates consider the development of career competences (being competences central in career development, such as networking or work exploration) as necessary to be fully prepared to enter the labour market (e.g., Bridgstock, 2011). Moreover, a more advanced development of career competences leads to a better understanding of students' qualities and competences, which gives them more insight in which competences they should additionally develop. Higher education should take an active role in stimulating the development of *career competences* by investing in proper career guidance. Although different approaches can be used to develop all career competences separately, Kuijpers, Meijers, and Gundy (2010) point out the importance of assigning a central role to the student in guiding their learning experiences, but simultaneously providing support to engage in a career dialogue.

Focus on career development during higher education

Another practical implication for higher education refers to the effects of self-efficacy and achievement goals. The third chapter focused on students' growth trajectories, but indicated mainly differences in starting values. This implies that having higher levels of self-efficacy and approach-orientations and low levels of performance-avoidance orientation within higher education is beneficial for work-related learning after graduation. Hence, higher education could foster self-efficacy, learning-goal orientation, and performance-approach orientation, leading to positive effects both within higher education (Schneider & Preckel, 2017) and beyond higher

education. Although future research could further investigate specific ways to foster these personal factors within the final phase of higher education, prior research did point to general principles to enhance achievement goals and self-efficacy. Presenting students *challenging tasks*, including practical experiences is considered to be important for both self-efficacy and achievement goals (Meece, Herman, & McCombs, 2003; van Dinter et al., 2011). However, *providing decent support* in every course is another means to this end. A supportive learning-environment was demonstrated to enhance the development of learning-goal orientation of students (Meece et al., 2003). van Dinther et al. (2011) also concluded that feedback has the potential to support students' self-efficacy.

⩥ *Enhance students' self-efficacy and achievement goals during higher education*

SUGGESTIONS FOR ORGANISATIONS

Although higher education institutions and individuals are generally considered to be the key players in providing an adequate set of competences, it is increasingly acknowledged that employers have a role to play as well (Evers & Rush, 1996). Higher education can never fully adapt their curriculum to the diversified needs of (all) employers (Teichler, 1999). We suggested (based on the findings of Chapter 1) that higher education focuses on generic competences. Recent graduates will have developed a set of competences, but it is crucial that employers know which competences are essential for their new employees. Only when employers are transparent regarding their expectations and needs, graduates will be able to detect the gaps in their existing competences prior to starting a job (Graham & McKenzie, 1995). As such, graduates will have a certain basis, on which they can build once they start working. Hence, it is important to keep in mind that graduates have the potential to grow, rather than that they are already fully performing from the very start. Consequently, it is crucial that employers tap graduates' potential and thus make the most of the competences graduates bring to their job.

⩥ *Be aware of graduates' potential and stimulate their development*

A second implication for organisations is inferred from the final chapter on education-job fit, in which we identified fit profiles. One of the conclusions focused on the fact that the degree of vertical fit mattered for participation in formal learning activities: Graduates who are employed in jobs that suit their level of their education, reported more formal learning such as trainings and seminars. As formal learning is generally considered to be employer-initiated (e.g., Kyndt & Baert, 2013), the results suggest that this group of graduates gets more opportunities to engage in formal learning than graduates with a less optimal alignment regarding their level of

education. However, graduates in a misfit condition are exactly the graduates who will benefit most of participation in formal learning, as their background is less aligned with their job. Consequently, it is important for employers to give special attention to those employees who are in a less favourable position. Mindful of the benefits of work-related learning, it is crucial to create formal learning opportunities for all graduates, especially those without vertical fit.

⩥ *Provide formal learning opportunities for employees with a lower degree of vertical fit*

A final suggestion for organisations includes the fact that work-related learning is not one-dimensional and can be done in more than one way. This dissertation emphasised the nature of work-related learning being engagement in learning activities that can be formal or informal (Kyndt & Baert, 2013). Three types of work-related learning were distinguished in the second chapter: formal learning activities, informal learning activities using personal sources, and informal learning activities using environmental sources. Although organisations usually focus on stimulating formal learning activities, especially in the case of early-career employees, the dissertation emphasised the importance of informal learning activities as well (Chapter 2). Therefore, we suggest that organisations stimulate a *wide range of learning activities* and include this as a spearhead of their human resource development policy. More specifically, when looking into the frequencies that are reported by graduates, graduates reported most participation in informal learning using personal sources, including discussing issues with others, observing others, reflecting, planning, asking feedback, and information-seeking. Hence, it is crucial that organisations stimulate these activities as well. Prior research has investigated different conditions that can facilitate this informal learning, including creating opportunities for feedback (i.e., feedback acquisition) or providing opportunities to engage in meetings to exchange information, for example by organising intervision moments (i.e., information acquisition) (Kyndt, Dochy, & Nijs, 2009).

⩥ *Do not only focus on formal learning, actively stimulate informal learning as well*

SUGGESTIONS FOR INDIVIDUALS

It becomes clear that the individual is still the key actor in the transition to work. Whereas we suggested higher education institutions and organisations to stimulate a learning environment (both in education and in work) for individuals, the individual continues to have the responsibility to take an active role in guiding his or her transition process. Chapter 1 revealed that graduates often do not feel prepared to enter the world of work. However, this chapter also revealed that in general graduates have developed most necessary competences to start in their (future) job.

Hence, we recommend final-year students to focus on the relevant experiences they acquired during higher education (and in their additional activities). Although a lot of individuals experience a gap between education and work – interpreted as a gap between theory and practice – they should realise that most higher education programmes do have multiple components in their curriculum that contribute to achieving professional practice, such as internships, problem-based learning, and the use of cases (Edvardsson Stiwne & Jungert, 2010). It is important that graduates are aware of their developed competences and its value in a working context. Prior research for example demonstrated the value of making a *portfolio* to keep track of students' or graduates' competences in the transition to work (Bridgstock, 2011).

⩥ *Be aware of the competences you have already developed*

Building on the suggestion above, it is not only important to explore what one *knows*, but also what one *wants*. This dissertation demonstrated the importance of the alignment between higher education and the first job for work-related learning (Chapter 4). As it is suggested that work-related learning can establish long-term career effects (Kyndt et al., 2018), the importance of this alignment is key. The fourth chapter has shown that graduates can capitalise on a head start: Graduates who are employed within their field of study and who are employed in a job that requires their educational level, participate more in work-related learning than graduates without a fit. Hence, in order to capitalise on a head start, it would be advisable to find a job that is aligned with graduates' educational background. However, this does not need to limit the options: For most educational programmes a wide range of jobs can lead to an optimal fit. Graduates will thus need to explore what type of job they prefer. In order to achieve this, they need to know what they want by exploring their possibilities and by planning their career. These are important aspects of career competences, which are demonstrated to be inevitable for graduates embarking on their career (Akkermans, Schaufeli, Brenninkmeijer, & Blonk, 2013). As such, we suggest graduates to develop their career competences, which can be achieved by engaging in the use of reflection instruments (increasingly available nowadays) or by engaging in career guidance (Kuijpers & Meijers, 2012).

⩥ *Reflect on and explore what you want before starting your job-search*

Although becoming future-proof starts already during higher education, remaining future-proof implies that graduates continue to learn at work (Heijke et al., 2003; Kowtha, 2011). Therefore, a final suggestion for individuals involves that they do not stop learning after graduation – more than that, create opportunities to continue learning. The developed instrument for work-related

learning (Chapter 2) lists 13 learning activities in which graduates can engage. Whereas work-related learning is often solely associated with trainings (i.e., formal learning) (e.g., Eraut, 2000), it is important to realise that informal learning activities get a prominent role as well. Reflection (i.e., planning and reflecting) and interaction with others, in terms of discussion, observing, meetings, and feedback-seeking, are key for recent graduates. Moreover, graduates can use environmental sources to engage in continued learning. Engaging in work-related learning will increase their performance, but it will also make them employable, as the improved or acquired competences have the potential to be transferred to other contexts (in the form of another job) as well (e.g., Kyndt & Baert, 2013). Therefore, it would be valuable for individuals to reflect on their own learning behaviour (for example by the use of the instrument to measure work-related learning) and to engage in activities for additional work-related learning.

⩥ *Don't stop me now: participate in work-related learning*

CONCLUSION

In a society that is characterised by rapid technological changes and globalisation, it is essential that individuals are able to cope with changes. As a consequence, engaging in work-related learning is a critical asset in order to be prepared for the future. Such work-related learning is already important from the very start of employees' career – making it especially important within the transition to work. This dissertation focused on increasing understanding of work-related learning within the transition and explored the relationship between personal and contextual factors and work-related learning. As such, this dissertation contributed to existing research by investigating the transition as a process that starts before graduation (1) and by taking both personal factors and contextual factors into account (2). The results demonstrated the value of higher education in being a foundation for future work-related learning in a broad sense. Higher education should prepare its students by also focusing on generic competences, and consequently to become future-proof learners, being graduates that are able to continue to learn throughout their career. Moreover, we demonstrated that self-efficacy and achievement goals, as personal factors, can be transferred from the educational context to the working context. Finally, the dissertation focused on education-job fit as contextual factor and showed that graduates working in a job that is aligned with their educational background capitalise on a head start concerning work-related learning. In conclusion, the results demonstrate that it is crucial that higher education takes its role in making students future-proof, because what happens before the transition – within higher education – plays a pivotal role in recent graduates' work-related learning.

The future depends on what you do in the present (M. Gandhi)

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Appendices



Appendix A. *Critical Appraisal Qualitative and Mixed Method Studies (Chapter 1)*

Study	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
		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
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 (Chapter 1)*

Study	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
	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, & Omey, 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 (Chapter 1)*

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 *Two measurement moments*	N = 24	X	X				
Abrandt Dahlgren, Reid, Dahlgren, & Petocz	2008	Sweden Australia	Qualitative interviews Documents regarding the educational programs	Political Sciences Psychology Mechanical Engineering Music Education Statistics	Students in their first year Students in their final year *One measurement moment*	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 One measurement moment	N = 550				X		
Baert, Cockx, & Verhaest	2013	Belgium	Quantitative Survey	All disciplines	Participants were 23 years old.	N = 1434				X	X	X

					Follow-up surveys were completed at 26 for cohort 1 and 29 years old for cohort 2 Two measurement moments					
Baytiyeh & Naja	2012	Lebanon	Quantitative Survey Qualitative Interviews	Engineers	Graduates who had been practising for no more than 10 years One measurement moment	N = 217 N = 17		X		
Biesma, Pavlova, van Merode, & Groot	2007	The Netherlands	Quantitative Survey	Public Health	Employers of entry-level academic graduates One measurement moment	N = 185		X		
Bonassi & Wolter	2002	Switzerland	Quantitative Survey	Business and Administration	Graduates who graduated one to three years ago One measurement moment	N = 121			X	X
Bridgstock	2011	Australia	Quantitative Survey	Creative Industry	Graduates at course completion and one year later. Two measurement moments	N = 208		X		
De Witte, Verhofstadt, &	2007	Belgium	Quantitative Survey	All disciplines	Participants were 23 years old.	N = 2212			X	

Omey						One measurement moment			
Dyess & Sherman	2009	United States	Qualitative with Groups	Study Focus	Nurses	Graduates with less than 12 months of practice experience One measurement moment	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 One measurement moment	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 Five to seven measurement moments	N = 20	X	
Evers & Rush	1996	Canada	Quantitative Survey		All disciplines	Students Graduates Managers Professors One measurement moment	N = 1610	X	X
Filstad &	2011	Norway	Qualitative	Case	Office-based	During the first	N = 32	X	

McManus			Studies, including Interviews, Conversations, Focus Groups and Observations	positions Paramedics	year of graduates Two or three measurement moments					
Finnie	2004	Canada	Quantitative Surveys	All disciplines	Two and five years after graduation Two measurement moments	N = 26441 (cohort 1) N = 30884 (cohort 2) N = 27937 (cohort 3)			X	
Garraway, Volbrecht, Wicht, & Ximba	2011	South-Africa	Qualitative Case Studies, with Document Analysis of Essays and Briefing Sessions	Chemistry	Students in their internship One measurement moment	N = 18	X		X	
Giret	2011	France	Quantitative Survey	All disciplines	Graduates, three years after graduation One measurement moment	N = 789			X	X
Graham, Shier, & Eisenstat	2014	Canada	Qualitative Interviews	All disciplines	Graduates who are engaged in a community based organisation One measurement moment	N = 15	X		X	X
Heijke, Meng, & Ris	2003	The Netherlands	Quantitative Survey	All disciplines	Graduates, three years after graduation One measurement	N = 3087		X	X	X X

					moment					
Holden & Hamblett	2007	United Kingdom	Qualitative Case Studies, with Interviews	All disciplines	Graduates, four times in the year following their appointment Four measurement moments	N = 5		X		
Johansson, Kopciwicz, & Dahlgren	2008	Sweden Poland	Qualitative Interviews	Political Sciences	Students at the end of their studies and when they had worked for one year Two measurement moments	N = 21	X		X	
Koen, Klehe, & Van Vianen	2012	The Netherlands	Quasi-experiment	All disciplines	Students who were about to graduate or who were just graduated One measurement moment	N = 93				X
Kogan & Unt	2008	Estonia Slovenia	Quantitative Survey	All disciplines	Graduates aged 25 – 35 years old and left education within the ten previous years One measurement moment	N = 2841				X X
Kowtha	2011	Korea	Quantitative Survey	Business Engineering	Graduates at the time of graduation, three months later and five months	N = 528 N = 380 N = 244		X		X

					later Three measurement moments				
Kuijpers & Meijers	2012	The Netherlands	Quantitative Survey	All disciplines	Students in their second and third year and career counsellors Two measurement moments	N = 4820 N = 371	X		
Landrum, Hettich, & Wilner	2010	United States	Quantitative Survey	Psychology	Graduates of one university in one discipline One measurement moment	N = 78	X		
Le Maistre & Paré	2004	Canada	Qualitative Interviews	Education Social Work Physiotherapy Occupational therapy	Students in their last year, beginning professionals in their first years of practice and supervisors of both groups One measurement moment	N = ?		X	X
Lindberg	2010	Sweden	Qualitative Interviews Quantitative Survey	Physicians	Graduates with one to three years experience and graduates who worked for one to two-and-a-half years	N = 9 N = 123	X		X

					One measurement moment						
Lowe & Krahn	1995	Canada	Quantitative Survey	All disciplines	Graduates Five measurement moments	N = 357	X		X	X	
Martin, Maytham, Case, & Fraser	2005	South-Africa	Qualitative Interviews	Chemical Engineering	Graduates (different years of graduation) One measurement moment	N = 16	X			X	
Maxwell & Broadbridge	2014	United Kingdom	Quantitative Survey	Business	Graduates in 2007 – 2011 One measurement moment	N = 142				X	X
McMurray, Roberts, Robertson, & Teoh	2011	United Kingdom	Curriculum Audit Focus groups Quantitative Survey	Psychology	Students One measurement moment	N = 77	X				
Nicolescu & Păun	2009	Romania	Quantitative Survey	Business and Economics	Graduates at the moment of graduation Employers that had as employees graduates in the last three years from all faculties of the university One measurement moment	N = 483 N = 472	X			X	
Nilsson	2010	Sweden	Qualitative Interviews	Physicians Engineers in Information	Graduates who had been working between one and	N = 43	X	X		X	

				Technology	eight months and a follow-up when they had been in employment for at least three years One measurement moment						
Opheim	2007	Norway	Quantitative Survey	All disciplines	Graduates, six months after graduation One measurement moment	N = 16320				X	
Pennbrant, Skyvell Nilsson, Öhlén, & Rudman	2013	Sweden	Qualitative Research, using Questionnaires	Nurses	Graduates in their first years of work One measurement moment	N = 330	X	X	X		
Renn & Hodges	2007	United States	Qualitative Research with Monthly Questions	Student affairs	Graduates who had begun full-time employment One measurement moment	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 More than ten measurement moments	N = 1970			X	X	
Sortheix, Dietrich, Chow, & Salmela-Aro	2013	Finland	Quantitative Survey	All disciplines	Students in the third year of upper secondary	N = 348					X

					education and followed-up four times until they were 25 years old Four measurement moments					
Sung, Turner, & Kaewchinda	2011	United States	Quantitative Survey	Mathematics Clothing and material design Study skills	Students One measurement moment	N = 132				X
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 One measurement moment	N > 12000		X	X	X
Verhaest & Omey	2003	Belgium	Quantitative Survey	All disciplines	Participants were 23 years old One measurement moment	N = 2122			X	X
Vuolo, Staff, & Mortimer	2011	United States	Quantitative Survey	All disciplines	Students in ninth grade, yearly until grade 12.	N = 1010			X	

					Renewed at age 31 – 32 and two and four years later. Seven measurement moments					
Yan, Gao, & Lam	2013	China	Qualitative Interviews	Social work	Graduates who worked in two agencies, who were working between one month and two years One measurement moment	N = 28	X	X	X	X
Zucchermaglio & 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 Six measurement moments	N = 92	X			

Appendix D. *Important Knowledge, Skills, and Attitudes per Study Discipline (Chapter 1)*

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	Learning skills (*n* = 10)	3	3	1	1	2	1	0

competences	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.

Appendix E. *Overview Learning Activities Included in the Instrument (Chapter 2)*

Item in Instrument		Reference(s)	Exemplary original item
Q1	Searched for information (websites, magazines, videos, books, etc.).	Berg & Chyung (2008) Lohman (2006) Noe et al. (2013)	Search the web (including intranet).
Q2	Tried something new (technique, method, behaviour, etc.).	Berg & Chyung (2008) Lohman (2006) Kwakman (2003) Noe et al. (2013)	Experimenting with new ways of performing my work.
Q3	Asked others for information.	Berg & Chyung (2008)	Ask questions in professional listservs.
Q4	Took part in a seminar/conference.	Blau et al. (2008) Lauber et al. (2010)	Attending conferences and symposia.
Q5	Attended a training/ (additional) course.	Berg & Chyung (2008) Blau et al. (2008) Lauber et al. (2010)	Attend a training program.
Q6	Thought about how I handled things.	Berg & Chyung (2008) Kwakman (2003) Lohman (2006) Noe et al. (2013)	Reflect on your actions.
Q7	Observed how others managed things.	Berg & Chyung (2008) Kwakman (2003) Lohman (2006)	Observe others.
Q8	Took part in a workshop.	Blau et al. (2008)	Workshops (e.g., customer service, laboratory testing).

Q9	Attended a presentation.	*New item*	
Q10	Asked the opinion of others on what I did.	Kwakman (2003)	Ask pupils' feedback.
Q11	Talked about work experiences with others.	Berg & Chyung (2008) Kwakman (2003) Lauber et al. (2010) Lohman (2006) Noe et al. (2013)	Talk with other people at work face to face.
Q12	Thought about how I would handle things on beforehand.	*New item*	
Q13	Took an e-learning course (online training).	*New item*	
Q14	Read magazines, websites, books, etc.	Berg & Chyung (2008) Kwakman (2003) Lauber et al. (2010) Lohman (2006) Noe et al. (2013)	Reading professional magazines or vendor publications.
Q15	Watched visual material (documentary films, instruction videos, etc.).	*New item*	

Appendix F. *Longitudinal Measurement Invariance (Chapter 3)*

Scale	Model					Model comparison			
		$\chi^2(df)$	CFI	RMSEA – 90% CI	BIC		$\Delta\chi^2(\Delta df)$	*p*	ΔCFI
Self-efficacy	Model 1 (configural invariance)	820.350 (410)	.958	.035 [.032; .039]	43417.304				
	Model 2 (equal loadings)	855.081 (431)	.957	.035 [.031; .038]	43324.681	Model 1 vs. Model 2 (metric invariance)	35.518 (21)	.025	-.001
	Model 3a (+ equal intercepts)	965.841 (452)	.947	.037 [.034; .040]	43307.629	Model 2 vs. Model 3a (scalar invariance)	126.249 (21)	< .001	-.010
	Model 3b (+ equal intercepts[a])	942.395 (451)	.950	.037 [.033; .040]	43286.717	Model 2 vs. Model 3b (scalar invariance)	97.998 (20)	< .001	-.007
Learning-goal orientation	Model 1 (configural invariance)	462.676 (210)	.943	.038 [.034; .043]	34167.226				
	Model 2 (equal loadings)	486.971 (225)	.941	.038 [.033; .042]	34095.416	Model 1 vs. Model 2 (metric invariance)	24.652 (15)	.055	-.002
	Model 3a (+ equal intercepts)	551.038 (240)	.930	.040 [.036; .044]	34062.570	Model 2 vs. Model 3a (scalar invariance)	65.470 (15)	< .001	-.011
	Model 3b (+ equal intercepts[b])	534.364 (239)	.933	.039 [.035; .043]	34051.354	Model 2 vs. Model 3b (partial invariance)	50.910 (14)	< .001	-.008
Performance	Model 1 (configural	132.545 (74)	.985	.031 [.022; .040]	29410.554				

-approach orientation	invariance)								
	Model 2 (equal loadings)	167.593 (83)	.978	.035 [.028; .043]	29388.857	Model 1 vs. Model 2 (metric invariance)	35.651 (9)	< .001	-.007
	Model 3a (+ equal intercepts)	333.104 (92)	.938	.057 [.050; .063]	29511.183	Model 2 vs. Model 3a (scalar invariance)	176.741 (9)	< .001	-.041
	Model 3b (+ equal intercepts[c])	220.333 (91)	.967	.042 [.035; .049]	29391.935	Model 2 vs. Model 3b (partial invariance)	56.605 (8)	< .001	-.011
	Model 3c (+ equal intercepts[d])	187.053 (90)	.975	.036 [.029; .044]	29361.848	Model 2 vs. Model 3c (partial invariance)	20.091 (7)	.005	-.003
Performance -avoidance orientation	Model 1 (configural invariance)	131.455 (74)	.985	.031 [.022; .039]	29778.710				
	Model 2 (equal loadings)	146.532 (83)	.983	.031 [.022; .039]	29734.191	Model 1 vs. Model 2 (metric invariance)	14.964 (9)	.092	-.002
	Model 3 (+ equal intercepts)	178.976 (92)	.977	.034 [.027; .041]	29709.473	Model 2 vs. Model 3 (scalar invariance)	34.850 (9)	< .001	-.006

[a] Except one intercept at wave 4 ('I will be able to achieve most of the goal that I have set for myself').

[b] Except one intercept at wave 4 ('I will try my best to improve my achievements from the past').

[c] Except one intercept at wave 4 ('I like showing that I am performing better than other students').

[d] Except two intercepts at wave 4 ('I like showing that I am performing better than other students' and 'I prefer working on projects in which I can show my competences to others').

Appendix G. *Comparison of Estimates (and 90% Confidence Intervals) of Intercepts and Slopes in LCGA (Chapter 3)*

		Profile 1		Profile 2		Profile 3		Profile 4	
		All (*N* = 143)	Excluding 62 (*N* = 121)	All (*N* = 339)	Excluding 62 (*N* = 310)	All (*N* = 194)	Excluding 62 (*N* = 187)	All (*N* = 138)	Excluding 62 (*N* = 134)
SE	Intercept	1.268 [1.095; 1.441]	1.251 [1.076; 1.426]	0.685 [0.545; 0.826]	0.680 [0.540; 0.819]	0.658 [0.486; 0.830]	0.649 [0.475; 0.822]	0.000	0.000
	Slope	0.112 [0.033; 0.191]	0.115 [0.034; 0.196]	0.249 [0.170; 0.328]	0.244 [0.165; 0.322]	0.181 [0.099; 0.263]	0.181 [0.100; 0.262]	0.254 [0.121; 0.387]	0.254 [0.122; 0.387]
LgO	Intercept	1.145 [1.218; 1.613]	1.418 [1.219; 1.618]	0.608 [0.408; 0.809]	0.613 [0.409; 0.816]	0.753 [0.496; 1.011]	0.753 [0.493; 1.014]	0.000	0.000
	Slope	0.218 [0.123; 0.312]	0.195 [0.099; 0.291]	0.340 [0.232; 0.447]	0.324 [0.216; 0.433]	0.125 [-0.034; 0.283]	0.124 [-0.033; 0.281]	0.197 [0.012; 0.382]	0.198 [0.010; 0.386]
PAp	Intercept	0.556 [0.221; 0.89]	0.555 [0.208; 0.903]	0.613 [0.335; 0.891]	0.616 [0.326; 0.907]	-0.725 [-1.124; 0.323]	-0.729 [-1.146; 0.312]	0.000	0.000
	Slope	0.875 [0.691; 1.059]	0.807 [0.622; 0.991]	0.844 [0.737; 0.951]	0.839 [0.732; 0.946]	0.927 [0.803; 1.145]	0.961 [0.788; 1.134]	0.910 [0.747; 1.073]	0.904 [0.737; 1.070]

PAv	Intercept	-1.595	-1.592	-0.127	-0.129	-1.482	-1.473	0.000	0.000
		[-1.937; 1.253]	[-1.939; 1.245]	[-0.521; 0.267]	[-0.535; 0.277]	[-1.805; 1.159]	[-1.802; 1.145]		
	Slope	-0.286	-0.292	-0.217	-0.208	-0.071	-0.076	0.095	0.084
		[-0.460; 0.112]	[-0.47; -0.113]	[-0.350; 0.084]	[-0.340; 0.076]	[-0.233; 0.090]	[-0.239; 0.087]	[-0.100; 0.291]	[-0.112; 0.280]

Note. SE = Self-Efficacy, LgO = Learning-goal orientation, PAp = Performance-approach orientation, PAv = Performance-avoidance orientation.
In a LCGA, the intercepts of the last profile are fixed to zero.

Appendix H. *Publication list*

PUBLICATIONS IN INTERNATIONAL PEER-REVIEWED JOURNALS

Grosemans, I., Coertjens, L., Kyndt, E. (in press). Work-related learning in the transition from higher education to work: The role of the development of self-efficacy and achievement goals. *British Journal of Educational Psychology.* doi:10.1111/BJEP.12258

Grosemans, I., Hannes, K., Neyens, J., & Kyndt, E. (2018). Emerging adults embarking on their careers: Job and identity explorations in the transition to work. *Youth and Society, Published Online,* doi:10.1177/0044118X18772695

Vangrieken, K., **Grosemans, I.,** Dochy, F., & Kyndt, E. (2017). Teacher autonomy and collaboration: A paradox? Conceptualising and measuring teachers' autonomy and collaborative attitude. *Teaching and Teacher Education, 67,* 302-315. doi:10.1016/j.tate.2017.06.021

Grosemans, I., Coertjens, L., & Kyndt, E. (2017). Exploring learning and fit in the transition from higher education to the labour market: A systematic review. *Educational Research Review, 21,* 67-84. doi:10.1016/j.edurev.2017.03.001

Kyndt, E., Gijbels, D., **Grosemans, I.,** & Donche, V. (2016). Teachers' everyday professional development: Mapping informal learning activities, antecedents, and learning outcomes. *Review of Educational Research, 86,* 1111-1150. doi:10.3102/0034654315627864

Grosemans, I., Boon, A., Verclairen, C., Dochy, F., & Kyndt, E. (2015). Informal learning of primary school teachers: Considering the role of teaching experience and school culture. *Teaching and Teacher Education, 47,* 151-161. doi:10.1016/j.tate.2014.12.011

BOOK CHAPTER

Grosemans, I., & Kyndt, E. (2017). Transition from higher education to the labour market: State of the art. In E. Kyndt, V. Donche, K. Trigwell, & Lindblom-Ylänne, S. (Eds.), *Higher education transitions: Theory and research* (pp. 209-218). New York, NY: Routledge.

CONTRIBUTIONS AT INTERNATIONAL SCIENTIFIC CONFERENCES

Grosemans, I., Vangrieken, K., Coertjens, L., & Kyndt, E. (2018*). The relationship between education-job fit and work-related learning in the first job.* EARLI SIG 14 Learning and Professional Development Conference. Geneva, Switserland, 12 September – 14 September 2018.

Grosemans, I., Coertjens, L., & Kyndt, E. (2017). *Grasping the role of personal factors in work-related learning: A latent growth class modeling approach.* Pathways into, through and out of Higher Education Hannover, Germany, 11 September – 12 September 2017.

Grosemans, I., Coertjens, L., & Kyndt, E. (2017). *Career competences at the end of higher education: The role of structural and personal factors.* Biennial EARLI Conference 2017. Tampere, Finland, 29 August – 2 September 2017.

Grosemans, I., Smet, K., Houben, E., De Cuyper, N., & Kyndt, E. (2017). *Development and validation of a measurement of work-related learning.* Congress of the European Association of Work and Organizational Psychology (EAWOP). Dublin, Ireland. 17 May – 20 May 2017.

Grosemans, I., Coertjens, L., & Kyndt, E. (2017). *Grasping the role of personal factors on work-related learning: A latent growth mixture modeling approach.* Annual Meeting American Educational Research Association. San Antonio (TX), USA, 27 April – 1 May 2017.

Vangrieken, K., **Grosemans, I.,** Dochy, F., & Kyndt, E. (2017). *Teacher autonomy and collaboration: A paradox? Conceptualising and measuring teachers' autonomy and collaborative attitude.* Annual Meeting American Educational Research Association. San Antonio (TX), USA, 27 April – 1 May 2017.

Grosemans, I., Coertjens, L., & Kyndt, E. (2016). *Exploring learning and fit in the transition from higher education to the labour market: A systematic review.* Annual Meeting American Educational Research Association. Washington, USA, 8-12 April 2016.

Grosemans, I., Dochy, F., & Kyndt, E. (2015). *Work-related learning of early-career employees: The role of higher education.* EARLI Jure 2015. Cyprus, 23 August – 24 August 2015.

Grosemans, I., & Kyndt, E. (2015). *Transition from higher education to work: State of the art.* Biennial EARLI Conference 2015. Limassol, Cyprus, 25 August – 29 August 2015.

Kyndt, E., **Grosemans, I.,** Boon, A., Verclairen, C., & Dochy, F. (2015). *Studying teachers' informal learning with mixed methods*. Annual Meeting American Educational Research Association. Chicago, USA, 16 April – 20 April 2015.

KU LEUVEN

Faculty of Psychology and Educational Sciences

Occupational & Organisational Psychology and Professional Learning